DOCUMENT RESUME

ED 440 818 RC 022 435

TITLE	Cispus: Experiences in Green.
INSTITUTION	Association of Washington School Principals, Olympia.
PUB DATE	1992-00-00
NOTE	255p.; For companion document on the Cispus Learning Center, see RC 022 396.
PUB TYPE	Guides - Classroom - Teacher (052) -- Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Camping; Conservation (Environment); Ecology; Elementary Secondary Education; *Environmental Education; *Facilities; Geology; Lesson Plans; *Outdoor Education; Plants (Botany); Safety; Stars; Wildlife
IDENTIFIERS	*Nature Study; *Outdoor Education Centers; Survival Skills

ABSTRACT

This document describes the facilities, grounds, and resources of the Cispus Learning Center in Randle, Washington, and presents lessons plans for outdoor and environmental education. The Cispus Learning Center is located on a tree-clad 45-acre site bordering Gifford Pinchot National Forest in southeast Washington. Constructed in 1964-65, the facility includes heated dormitories with showers and toilet facilities, dining hall, auditorium, education building with various resources and natural history displays, lounge, play fields, gymnasium, dispensary, covered pavilion, meeting rooms, campfire circle, trails for hiking and nature study, and ropes courses. Users of the Learning Center present their own programs and can draw on abundant and varied wildlife, trees and plants, geologic features, and sites for aquatic investigations. The trails and physical facilities are described in detail, and general information, typical schedules, available resources, building plans, and site maps are provided for program planning. A brief handbook for student counselors is included. Lessons plans include focus, group size, time and materials required, physical setting, handouts, and instructions for group activities. The lesson plans are presented in the following categories: (1) star watching (constellations, moon, and meteors); (2) rocks, erosion, soil, and the geology of the Cispus Valley; (3) local landmarks (Mt. St. Helens, caves, and archeology); (4) safety practices and survival skills; (5) water resources, endangered species, wildlife management, and conservation; (6) ecology (animal adaptation, food chains, biodiversity, and plants in the ecosystem); and (7) other lessons (creative writing, food, observation, and weather). (SV)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 440 818

Cispus

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY
Martin E Fortin
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
2A

Experiences in Green

BEST COPY AVAILABLE

RC 022 435

The Cispus Learning Center

Administered by

The Cispus Foundation
of the
Association of Washington School Principals
and
Educational Service District #113

Brian Barker, Director

Martin E. Fortin Jr., Manager

1992

2142 Cispus Road
Randle, Washington 98377

Phone: (206) 497-7131
Fax (206) 497- 7132

This is Cispus ...

The Cispus Learning Center is located on a tree-clad 45-acre site on the western edge of beautiful Gifford Pinchot National Forest in the southeast corner of Washington State's Lewis County. Constructed for the Job Corps in 1964-65, this unique facility includes heated dormitories with showers and toilet facilities, dining hall, auditorium, education building with a variety of instructional resources and displays, lounge, playfields, gymnasium, dispensary, covered pavilion, meeting rooms, campfire circle and hiking/study trails all of which contribute to the implementation of many kinds of programs for guests of all ages. Cispus also offers ropes course programs provided arrangements are made well ahead of time.

Those responsible for planning and supervising a program at the Center need to know what kinds of meeting rooms, resource materials, displays and types of equipment are available. It is also important for visitors to understand the policies and procedures that are followed at Cispus since they will be responsible for setting up dining tables before meals, helping with dishes and for cleaning the dormitories and meeting spaces to which they are assigned. Program planners are therefore strongly advised to make a visit to Cispus prior to bringing their respective groups. They can then see for themselves exactly what facilities and resources are on hand to help them meet their specific program objectives. They will also learn what they will have to bring to supplement the Center's resources. Such orientations always pay off in terms of more productive and enjoyable programs when the entire group eventually comes to Cispus.

People utilizing the Learning Center present their own programs; they do not come to take "the Cispus Program". This philosophy reflects a clear recognition that incoming teachers and supervisors are best qualified to determine their own specific program objectives and purposes. The Center's unique inventories of educational and recreational materials provide many activity options for program planners to consider.

The Cispus River Valley is covered by dense second-growth forest consisting primarily of conifers, but with a heavy scattering of deciduous species, especially along the waterways. The Center is bordered by the Cispus River on the north and by Yellowjacket Creek on the east. Two freshwater ponds, several creeks and the nearby river provide abundant opportunities for aquatic investigations of many types.

A thin layer of ash from the 1980 eruptions of Mt. St. Helens blankets soil layers composed mostly of tephra from previous volcanic eruptions. Geology students have a wealth of prominent topographical features to consider in this watershed which was partially reshaped by a glacier that filled the valley during the last Ice Age some 10,000 years ago. An on-site soil pit reveals layered deposits dating back some 13,000 years.

Alert observers may catch a glimpse of deer, elk, beaver, otter, grouse, water ouzels, harlequin ducks and other wildlife in the valley. Trees, ferns, mosses and wildflowers also receive much attention from students, hobbyists and professional researchers. An amazing number of many kinds of mushrooms and other fungi carpet the whole watershed, particularly during the spring and fall months.

A collection of basic weather instruments provide daily high/low temperature and precipitation readings which are posted in the Education Building. Those interested in having their students learn something about meteorology, graphing and perhaps data interpretation have the information and displays needed to accommodate such studies.

Trails ...

Covell Creek Trail was constructed in the spring of 1973 by the Olympia High School Special Education Class. This trail begins across the road from the Center's entrance, and extends for approximately three quarters of a mile to where it comes out in the area formerly occupied by government trailers during the construction days of 1964 and 1965. Trailers #8,#9 and #10 are located close to the common exit of the Covell Creek and Braille Trails. Easy to follow, the Covell Creek Trail winds through beautiful stands of conifer and deciduous trees along the creek. This is an especially productive area for students, teachers and anyone seeking the tranquility and serenity of an attractive forest setting.

The Braille Trail is marked by some 2400 feet of guide rope as it wends its way through Douglas Firs, vine maples, cottonwoods, wood sorrel, Oregon grape, salal and broad leafed maples which are much appreciated by the visually-impaired, casual strollers and environmental students alike.

Those desiring more of a physical challenge will enjoy an up-hill hike to Angel Falls where Covell Creek spills over a big rock face covered by ferns and mosses. The route has been altered so as to avoid having to cross Road 28 twice as it did formerly. The new access takes off from the top of the Covell Creek Trail a few feet from the west side of the foot bridge near the study shelter. The falls are located about a mile and a half from the Center so allow time to make the full three mile roundtrip.

The top of Burley Mountain is available via Roads 77 or 7605. Check with the Cispus office for directions. From an altitude of just over 5300 feet, the summit of Burley offers really spectacular views of Mt. Adams, Mt. Rainier, Mt. Hood and Mt. St. Helens. Sunrises and sunsets from Burley are very special!

The Pond Trail takes off from behind the gymnasium, and follows the Yeliowjacket Creek up to, and across, the bridge, then another quarter of a mile to a couple of freshwater ponds that serve as excellent sites for a variety of aquatic investigations. The fact that both are periodically stocked with rainbow trout does not detract from their popularity.

The River Trail takes one from the Campfire Circle a few hundred yards through cottonwoods, maples, alders and scattered conifers to the confluence of Yellowjacket Creek with the Cispus River. Extensive gravel bars, a dynamic floodplain and great scenery offer esthetic pleasure as well as abundant study opportunities. The water is colder, swifter and deeper than it appears so please do not let youngsters take this trail unless they are supervised by adults.

Reminder to study groups...

Those engaging in environmental studies have a special responsibility for the plants, animals and habitats they are studying. Study sites should be left as nearly as possible as they were found. Excessive disturbance of habitats is at least as damaging as heavy collecting. Specimens should be examined in place, and animals should be returned to the site from which they were collected.

1. See that hikers stay on trails, and avoid making new trails or shortcuts.
2. Avoid collecting plant and animal specimens in the immediate vicinity.
3. Prevent the building of survival shelters.
4. Impress upon your groups the importance of litter control.
5. Leave "nurse logs" and dead stumps intact.

Your cooperation in these matters is not only appreciated, it is absolutely vital to keeping the Center and its environs the kind of place to which you will want to return and which visitors of all ages will continue to enjoy.

Weather...

Those approaching Cispus from Randle along the black-topped Road 23 between towering walls of magnificent trees often have the impression they are going up into the mountains. The Center's 1300 foot elevation is actually not very much above sea level, and the Cispus climate reflects its transitional position between eastern and western Washington. If, and when, winter brings more than an inch or two of snow, the roads are kept open to accommodate school buses serving local residents. Annual rainfall of between 45 and 60 inches is typical of the area. In general, Cispus weather is similar to that of Seattle and Tacoma, and the Center is a full-year-around facility.

Physical Facilities...

Originally constructed as a Job Corps Center, the 45-acre site has a variety of buildings which accommodate many different kinds of programs. Buildings are heated and well lighted.

Housing units include seven dormitories each of which contains 48 wooden-framed beds with mattresses. Visitors bring their own sleeping bags or bedding. Shower stalls, toilets and wash basins with mirrors are available on both sides of each dorm. The floor plan provides four bays each of which is furnished with 11 beds, and two separate rooms with two beds each near the dorm entrances. A lockable door is located in the middle of each dormitory which provides the privacy necessary to assigning both sexes to the same dorm. Group leaders are asked to emphasize the necessity of keeping dorm doors and windows closed during the colder months to ensure their own comfort and to conserve energy.

The Center's large dining hall is furnished with table-bench units which make it easy to set up for meals and to clean the eating areas. Visitors are responsible for placing, setting and cleaning their respective table-benches for each meal. Student groups also help with dishwashing chores. Wholesome meals are prepared by Cispus staff members, and meals are served family-style. Breakfast is usually served at 8:00, lunch at noon and dinner at 5:30. Arrangements can be made for sack lunches for extended field trips if sufficient prior notice is given.

The Sasquatch Lodge is the one remaining building left from when the Cispus site served the Civilian Conservation Corps (C.C.C.) some fifty years ago. Repaneled, carpeted and provided with window drapes, the Sasquatch is one of the Center's most popular meeting, planning and relaxing areas. It boasts a nice stone-faced fireplace and comfortable furniture.

The Littlefoot Lair is another very functional meeting space, or arts and crafts workroom, for up to 25 or 30 individuals. It is situated on the east end (toward the dining hall) of the same building that houses the Sasquatch Lounge.

The spacious Education Building offers a combination of meeting rooms and a surprising assortment of learning resources. Hall displays are interesting and informative. The large Conference Room holds more than 150 seated individuals, or several smaller sub-groups. It is furnished with drapes which accommodate the use of projectors during the daylight hours. Each of the following rooms can also serve as small group meeting areas if needed.

Elementary and middle school groups make good use of the materials and displays in the Survival Education Room. Helping others to understand how to avoid panic when lost, how to navigate in the wilderness and how to find shelter, food and water becomes a very practical form of life insurance since none of us really knows what the future holds regardless of our current life styles.

The Natural History Room holds insect collections, informative displays, and a variety of stuffed specimens of general interest to some and of specific interest to those trying to help students understand predator-prey relationships, protective adaptations and anatomical similarities or differences of some of the area's residents.

The Skull and Pelt Room is very popular with visitors of all ages. The State Wildlife Department has loaned a number of high quality mammal pelts for Center use, and these have been supplemented with an assortment of skulls, horns and antlers. Identification, natural history and carrying capacity along with the various implications of utilizing animal pelts for clothing are among the many topics and issues typically considered here.

The carpeted Library contains an impressive collection of reference books and several periodicals pertaining to plants and animals, wildlife management, ecology and environmental issues of many kinds. Teachers find it rewarding to browse through the voluminous files of suggested student activities, environmental investigations and learning games which help so much in planning programs for students. Although available for their use, groups are requested not to use the Library as a general meeting room or classroom.

Colorful murals depicting woodland settings line the very functional Forestry Room which can accommodate 40-50 for films, lectures and other activities.

Spectacular photographs and an excellent scale model are the main attractions in the Mt. St. Helens Room. Detailed explanations of these and other available resources, combined with a viewing of the Forest Service's film on the 1980 eruption provide a highly informative preview, or follow-up, to an actual visitation to the devastated area around the volcano. The Center is just 34 miles by road from Windy Ridge, which is as close to the crater as the public is allowed to go. Cispus lies within the Mt. Adams watershed, so is not endangered by any present or future mudflows which might result from resumption of major eruptive activity by Mt. St. Helens.

Groups of up to 300 use the Auditorium located in a large converted garage building just down the street from the Education Building. Interior dividers have been removed, the walls have been painted and drapes have been installed on all the windows to make this an inviting meeting place for larger groups or for a number of sub-groups. The concrete floor is heated, and the acoustics are very respectable. This is where most groups hold their dances. A stage and piano complete a package which is particularly appreciated by those who find it expedient to move important campfire programs inside during periods of inclement weather.

The Star Room is lined by murals of Tower Rock, Covell Creek and local woodland trails. The ceiling is dotted with pigmented paints corresponding to the actual positions of the stars in a June night sky at Cispus. The floor is carpeted, and shielded ultraviolet lights are used to stimulate the "stars" in an impressive fashion. Poetry, astronomy, creative writing, story-telling, Indian myths and even wolf-howlings are held here.

Those interested in the history of the logging industry will enjoy examining the old drag saw, springboards, hand saws, tree calipers, scaling sticks and fire-locator on display in the Logging Room next to the Auditorium. The Earth Room also contains some useful instructional displays and provides a nice classroom-sized meeting and working space. The Little Theater is another spacious meeting room with a lot of flexible uses. Its location behind the Center's Workshop provides a quiet space away from the distractions of vehicle traffic and the activities of other groups that may be here.

A full-sized hardwood floor gymnasium is a much-used resource. Outdoor volleyball courts and large grass playfields offer exercise options during break periods between learning or planning sessions.

A large covered pavilion offers some 2000 square feet of concrete-floored activity space along with an attractive fireplace. Benches and full lighting facilitate use of this structure in which guests have the feeling of being outside, but are well protected from the elements. The Campfire Circle is in the northeast corner of the campus amid towering Douglas Firs and a mixture of deciduous trees. Sturdy amphitheater seats facing the fire circle and stage provide a natural setting for the skits, songs and stories which so many groups enjoy.

The Center's Dispensary lies across the street from the Education Building just to the south of the Main Office. It provides an office, a three-bed open bay, an isolation room, nurse's quarters, toilets, shower and a limited supply of first aid equipment. Visiting groups are responsible for their own medical care.

Amphitheater seating and a stage are available to Cispus visitors just to the rear of the Education Building. A large screen is mounted on the building wall for those wishing to use projectors outdoors during the nicer weather.

The Cispus equipment inventory includes limited numbers of basketballs, volleyballs, footballs, soccerballs, compasses, rock picks, gold pans, hand lenses, magnifying glasses, dissecting microscopes, water-test kits and other items for educational and recreational purposes. -

Audio-Visual resources include VCRs, monitors, movie projectors, overhead projectors, slide projectors, and an opaque projector. Make arrangements to reserve projectors ahead of time if there will be several groups here during your visit. Over 100 motion picture films dealing with natural resource management, survival in the wilderness, ecology and the natural history of plants and animals are available for use in the Education Building. A collection of videotapes is gradually being added to the list of AV resources.

General Information ...

The Cispus Learning Center is administered by the Cispus Foundation of the Association of Washington School Principals and Educational Service District 113, both of which have their headquarters in Olympia. The Cispus Director is based in the AWSP Office, and the Cispus Center Manager is based on-site at the Center.

The Center's local staff is a team consisting of the manager, a couple of people helping to coordinate programs, a ropes course supervisor, two office secretaries, a maintenance crew, and a kitchen supervisor along with her group of competent cooks. The lack of a traditional custodial staff makes it especially important for visitors to accept responsibility for helping to keep the facility and its resources clean and intact.

Groups in need of program planning assistance, inservice preparation of teachers, an orientation to the Cispus Center's educational potential, suggested teaching strategies or evaluation techniques should make arrangements for such services by contacting the Cispus Manager in the Center's main office. Regular office hours are from 8:00 a.m. to 4:30 p.m. seven days a week all year long.

Visitors are responsible for their own medical care. Registered nurses, those with EMT training or other qualified individuals do have access to the dispensary. Emergency 911 services are available from Randle, and emergency medical treatment is just thirty miles away at Morton General Hospital.

Groups with their own instructional and recreational equipment are encouraged to bring whatever items are essential to their programs. The Center's equipment is available to supplement what clients bring. Youth group leaders should make a special point of reminding their participants to bring clothing appropriate to the season. A limited number of rain capes and overshoes are available to those who do not have the protective clothing needed during inclement weather.

Prior to your group's arrival at Cispus ...

Those in charge of implementing programs are strongly advised to arrange for a personal orientation to the physical facilities and surrounding area well before they bring their groups to Cispus. These "pre-visitations" enable folks to see for themselves exactly what buildings, trails, equipment, learning resources, instructional displays, living quarters, meeting areas, study sites and recreational opportunities can be most effectively utilized to make their particular programs as productive and enjoyable as possible. Careful preparation and attention to logistical details are absolutely essential to a truly outstanding Cispus experience. Informed planners make the best decisions!

Schedules should account for every hour spent at the Center. Recreational, or "free", periods should be supervised by one or more adults at all times. Signed parental permission slips, equipment lists, task assignments, arrangements for resource speakers, recommended personal item lists and a bewildering number of other details must be dealt with by your program planning team. When first considered, the details seem overwhelming, but when tackled one at a time - and when care is taken not to overlook any of the essentials - planning diligence is the best guarantee of a really rewarding program.

Experience indicates that, regardless of the age of participants, one individual should be given the critically important position of Camp Director. This person would accept responsibility for coordinating program planning, scheduling, selecting and training teachers, completing contract forms, arranging transportation, collecting funds, managing equipment, delegating tasks, etc. The Camp Coordinator of educational groups should probably not try to teach while at Cispus since his, or her, supervisory duties will demand their full attention.

Those accepting teaching roles should be given the psychological and educational support inherent in any well-organized inservice program. Regardless of one's academic proficiency, if all of their formal instructional experience has occurred within the four walls of school classrooms, teaching outside can seem genuinely threatening. Even a brief encounter with forest trails, ponds, soil pits, anthills, gravel bars, "nurse logs", woodland streams, plant communities, weather stations and other study sites will help build the self-assurance needed to realize one's full teaching potential when working outside with inquisitive students. Make arrangements at the front office for staff assistance in planning and implementing inservice programs for instructors.

It is especially important for those planning educational programs that are to be implemented at Cispus to clearly identify precisely what they expect their participants to gain by such an experience. Once the planning team has reached a consensus regarding their particular objectives, written copies should be made so that all concerned have a common set of purposes upon which to base the decisions that will largely determine how productive and enjoyable their group's stay at Cispus will be. Those organizing a program for the first time may wish to involve Cispus staff in a planning session which could be held in conjunction with the team's orientation visit to the Center.

Setting up a realistic time schedule is one of the planning team's major responsibilities. Distances and transportation arrangements have an obvious impact upon the schedule, and the Cispus staff needs a fairly accurate indication of arrival and departure times. Center meals are usually served at 8:00, 12:00 and 5:30. You'll need to send table setters to the dining hall approximately 15 minutes prior to each meal. The length of your study sessions will be correlated with your learning objectives, student attention spans, distances to study sites and the activities being pursued. Please keep in mind that schedules must account for the all 24 hours of every day you spend at Cispus. Minimizing "free" time will reduce the number and magnitude of the problems you will encounter.

Some type of written evaluation of the strengths and weaknesses of your Cispus experience (as measured against your own program objectives) should be made to help your group's future planners understand what really works best for your particular clientele.

Cispus dining hall procedures ...

To minimize confusion and frustration at your first Cispus meal, please assign a dining hall supervisor, and make certain that they clearly understand how the Center's dining hall system operates. Your supervisor should be prepared to issue instructions to table setters, diners and dishwashing crews. A speaker system facilitates the giving of instructions.

1. Supervisor and table setters to dining hall 15 minutes before meals.
2. Check with kitchen staff, and set up table units needed for your group.
3. Set tables with plates, silverware and napkins.
4. Group enters dining hall, and all are seated. We eat "family style".
5. This is a good time for group leaders to give program announcements, for observing a moment of silence, for saying grace, etc.
6. One "jump-up" from each table unit goes to serving counter to obtain food servings for their respective tables.
7. After meals, unconsumed food is returned to serving counter.
8. Food scraps are scraped into receptacles provided.
9. Take dirty dishes, silverware and paper items to marked windows.
10. Wipe tables and benches with damp sponges that are provided.
11. Fold table units and push aside to facilitate sweeping.
12. Mop-brooms are in metal cabinet in corner. Sweep floor and damp-mop if needed. Always damp-mop your eating area after your last meal.
13. Dishwashing crew reports to kitchen staff for assignments.

Thanks for your cooperation!

A Representative Schedule ...

Those accepting responsibility for planning a Cispus environmental education program for the first time may appreciate the following sample schedule which provides some ideas around which to plan a schedule tailored to meet their own specific learning objectives.

First Day

8:30-9:15	Load buses at school.
9:30	Depart from school for Cispus.
11:30	Arrive at Cispus. Move into assigned dormitories.
11:45	Supervisor and table setters to dining hall.
12:00	Lunch. Table units cleared, cleaned and folded. Dining area swept. Dishwashers help kitchen staff.
1:30-4:30	Study sessions
4:30-5:15	Supervised recreation
5:15	Table setters to dining hall.
5:15	Flag lowering ceremony
5:30	Dinner. Table units cleared, cleaned and folded. Dining area swept. Dishwashers help kitchen staff.
6:00-7:00	Study and supervised free time. Plan campfire skits. Work on assignments.
7:00-8:30	Campfire. Program in auditorium or pavilion if rainy.
8:30-8:45	Return to dorms and prepare for bed. Lights out!

Mid-Week

7:00	Rise and shine!
7:45	Flag raising. Table setters to dining hall.
8:00	Breakfast. Announcements. Table units cleared, etc.
8:30-9:00	Clean dorms. Prepare for study sessions.
9:00-11:30	Study sessions
11:30-12:00	Clean up and prepare for lunch.
11:45	Table setters to dining hall.
12:00	Lunch. Announcements. Table units cleared, etc.
1:00-1:45	Rest, and letter writing.
1:45-4:00	Study sessions
4:00-5:00	Supervised recreation
5:15	Flag lowering ceremony. Table setters to dining hall.
5:30	Dinner. Instructions for evening. Table units cleared, etc.
6:00-7:00	Study and supervised free time
7:00-8:30	Campfire program or educational sessions
8:30	Return to dorms. Prepare for bed.
9:15	Lights out!

Representative Schedule continued:

Final Day

7:00	Everybody up!
7:45	Flag raising ceremony. Table setters to dining hall.
8:00	Breakfast. Clean up and departure instructions. Table units cleared, cleaned and folded. Dining area swept and damp-mopped. Dishwashers help staff.
8:30-9:00	Clean dorms, and prepare for last study session.
9:00-10:30	Study sessions
10:30-11:15	Final cleanup of all buildings utilized during stay. Return all equipment to proper storage rooms. Remove all personal belongings from dorms, and take to loading area. Pick up litter, especially by dorm entries.
11:15-11:30	Pick up sack lunches. Load buses. Depart for home.

...

Additional info ...

Pay phones are available at the east side of the main office building and outside the southwest corner of the dining hall.

Please park vehicles only on black-topped areas, not on the grass.

The bringing of pets is not encouraged, and they are not permitted in the dining hall or dormitories.

Furniture should not be moved from one building to another without prior approval. All moved furniture must be returned by users to its original location.

Resources available at the Cispus Learning Center ...

Limited numbers of the following items are available to Cispus visitors.

Basketballs	Footballs
Volleyballs	Soccerballs
Softballs	Playground Balls
Bats	Archery Equipment
Parachute	

Opaque Projectors	Carrousel Projectors (35 mm)
Wollensak Tape Players	Movie Projectors
Overhead Projectors	Easels
Portable Screens	Bullhorn
Video Cassette Recorders (VHS)	Monitors

Compasses	Geology Picks
Soil pH Kits	Hand Lenses
Soil Thermometers	Dissecting Microscopes
Tape Measures (100')	Small Plastic Cups with Lids

In addition to the resources listed above, program planners will find a collection of learning guides which have been prepared by teachers, curriculum specialists and agency representatives on a variety of nature study topics pertinent to the Cispus River Valley. Subjects addressed include:

Amphibians and Reptiles of the Cispus River Drainage
Identifying Birds at the Cispus Learning Center
Aquatic Insects of the Cispus Region
Terrestrial Insects of Cispus
Macrofungi of the Cispus River Drainage
Mammals of the Cispus Area
Key to Winter Twigs
Geology of the Cispus Area
Plants of the Covell Creek Trail
Guide To the Trees of the Cispus Learning Center
Stargazing Guide
Collection of Ideas for Use at the Cispus Learning Center
Maps of the Center and of the Five Local Trails

What to bring to Cispus ...

This obviously depends upon the nature of your program, the types of activities in which you plan to participate, the season of the year, the length of stay and a host of other variables dependent upon your personal needs, but the following list of suggestions should prove helpful.

Sleeping Bag or Bedding: (We have wood-framed beds with mattresses.)

Clothing: (Come prepared for cold or wet weather...needed, or not!)

- Complete change...sweater, shirt, pants, underwear, socks and shoes
- At least one pair of socks for each day you are here
- At least one pair of long pants...even in summer!
- Warm coat or jacket
- Pajamas
- Rain gear...hat, coat, water-resistant footwear

Toilet Articles:

- Bath towel and wash cloth
- Soap and shampoo
- Toothbrush and toothpaste
- Comb or hairbrush
- Hand lotion

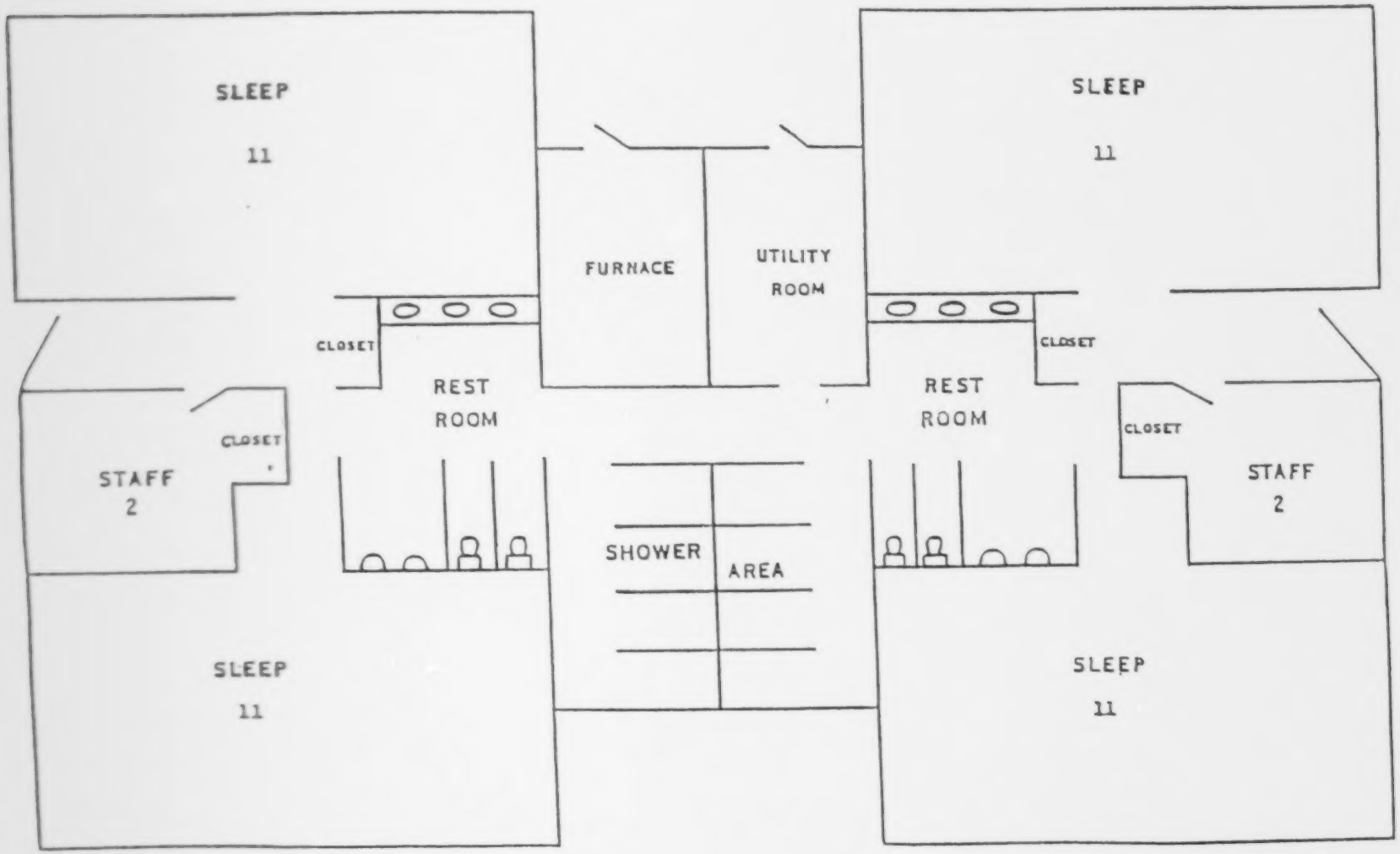
Additional Items You May Wish to Consider:

- Camera and film
- Alarm clock
- Dark glasses
- Wristwatch
- Pen, pencil and notebook
- Insect repellent
- Sunshield
- Kleenex
- Chapstick
- Flashlight

Please label your possessions, and double-check when departing to make very certain that you leave none of your personal things behind. If something does turn up in "lost and found", it will cost a minimum of $5.00 to have it packaged and mailed to you.

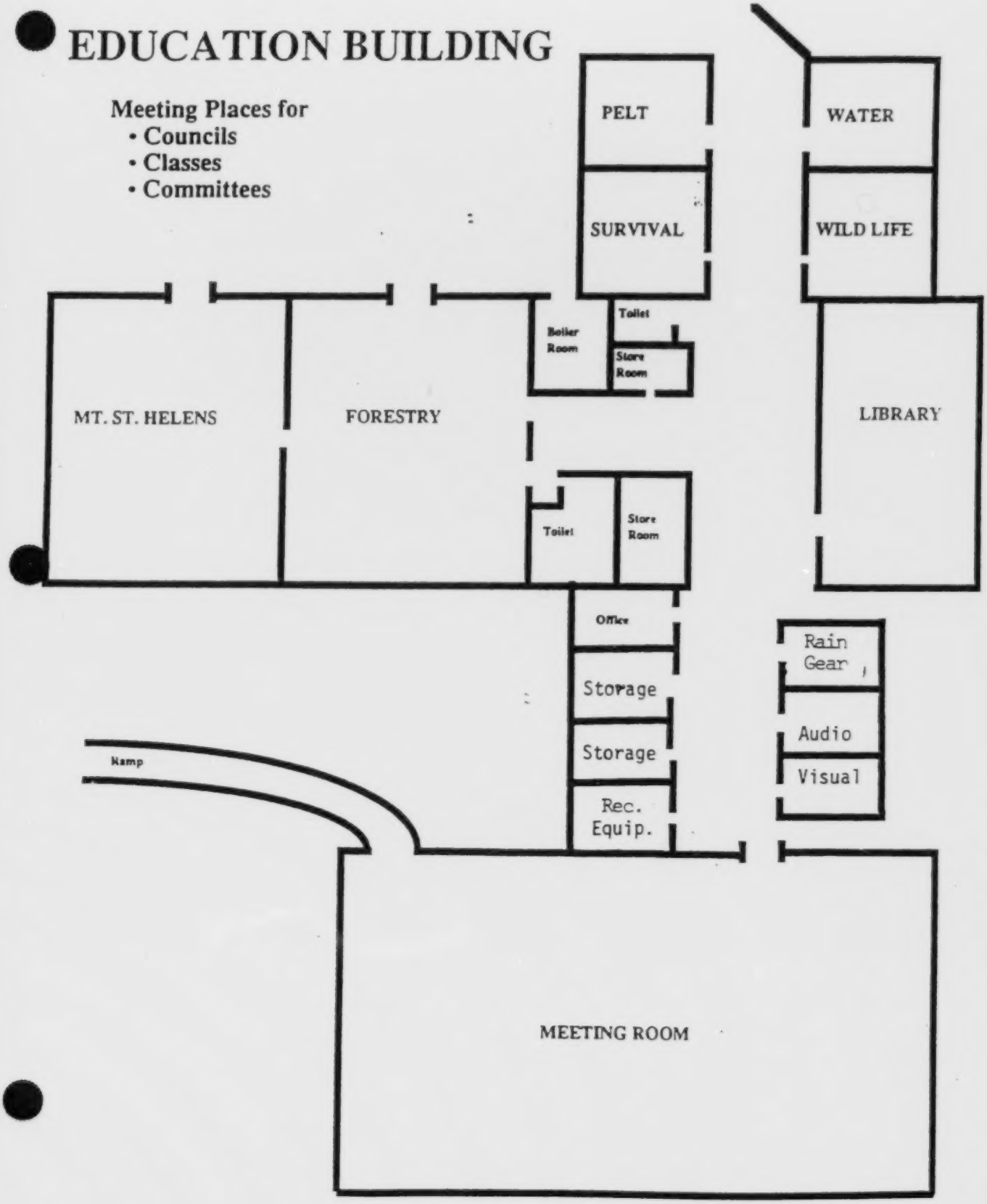
We sincerely hope that your stay at Cispus is productive and thoroughly enjoyable for all of your participants. Our staff will be happy to assist you in any way we can, so do not hesitate to call on us.

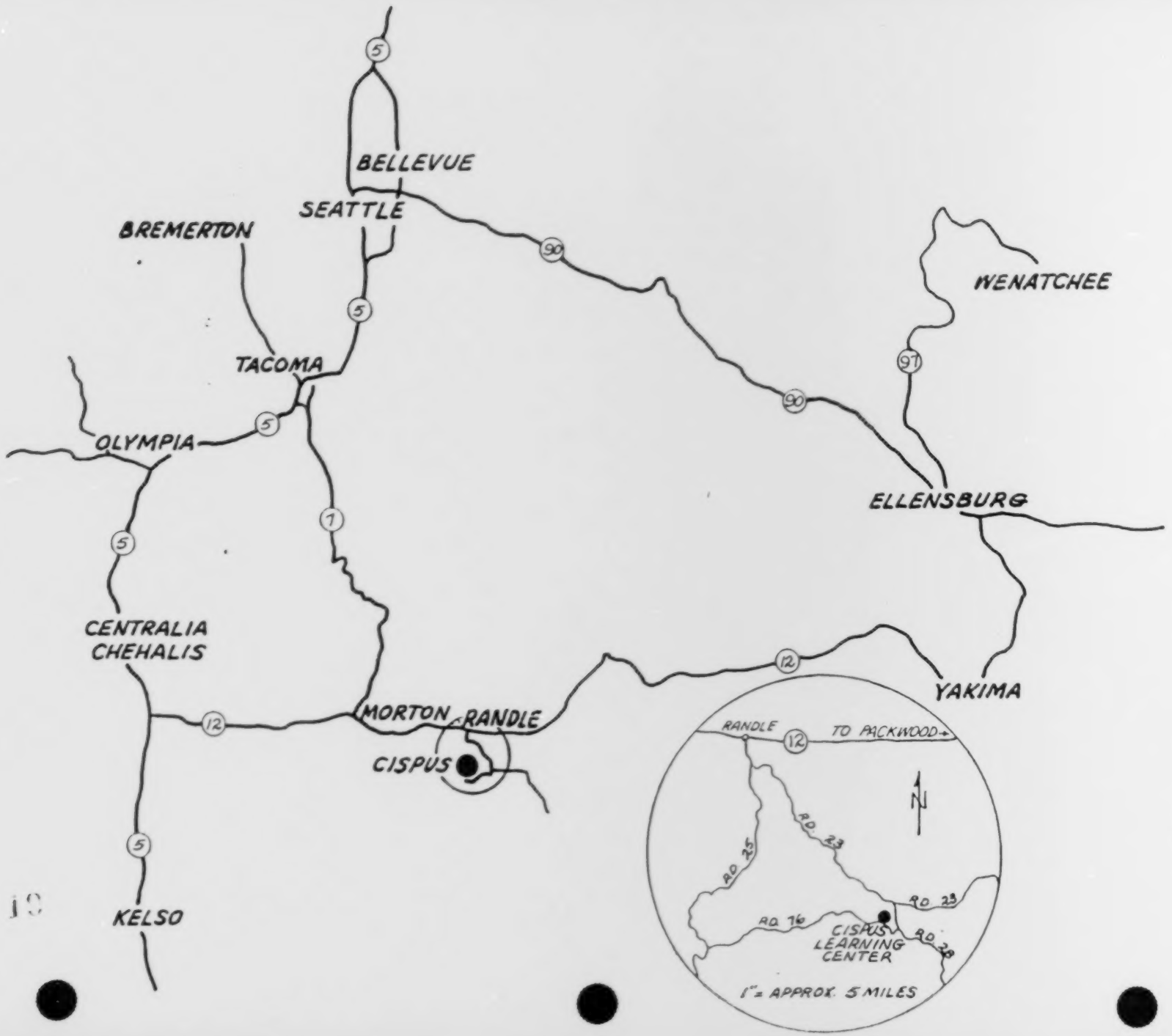
Cispus Dormitory

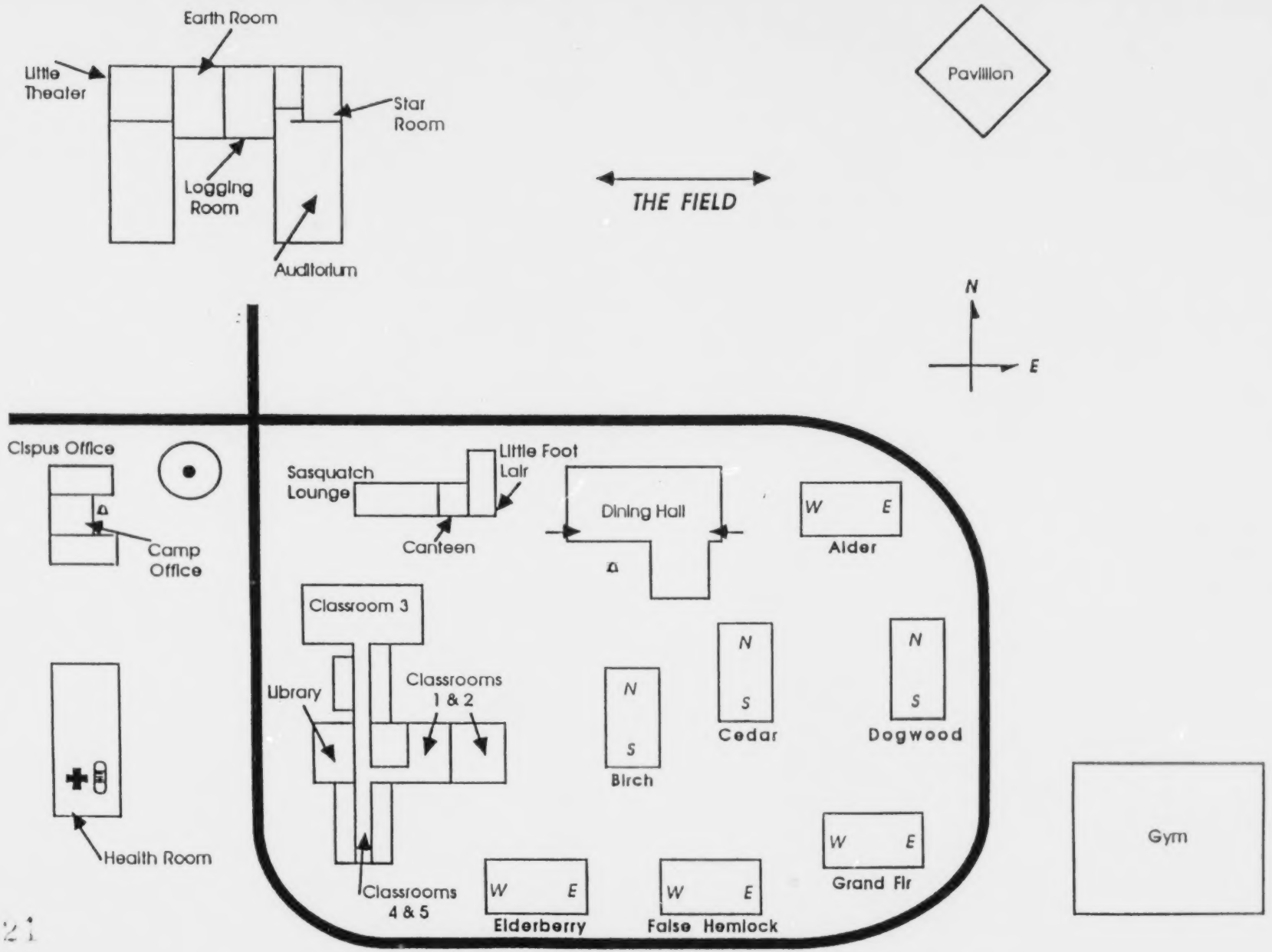


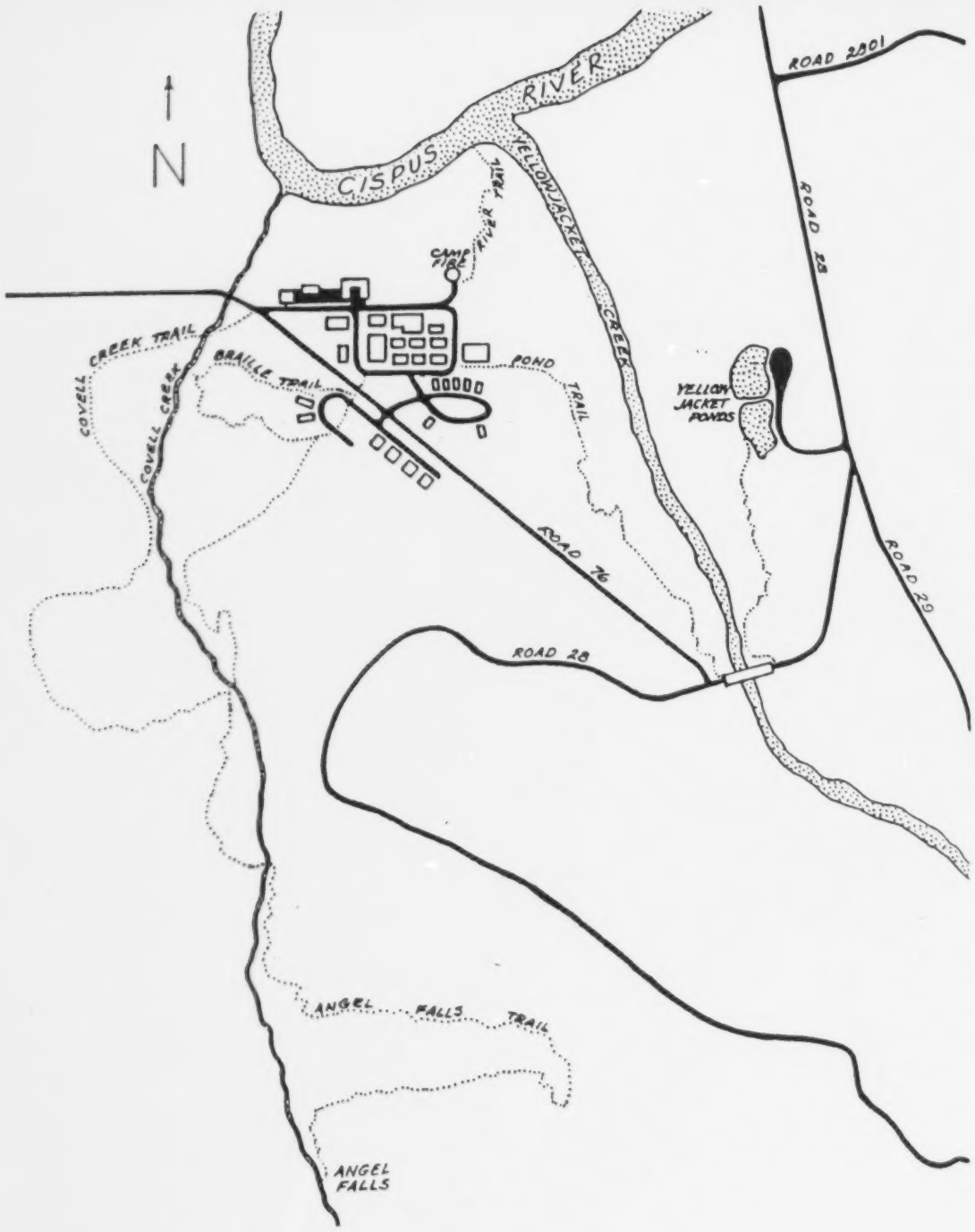
EDUCATION BUILDING

Meeting Places for
- Councils
- Classes
- Committees




BELLEVUE
SEATTLE
BREMERTON
TACOMA
OLYMPIA
CENTRALIA
CHEHALIS
KELSO
MORTON
RANDLE
CISPUS
ELLENSBURG
YAKIMA
WENATCHEE
5
90
97
7
12
RANDLE
TO PACKWOOD
RD 23
RD 25
RD 76
CISPUS LEARNING CENTER
1" = APPROX. 5 MILES


Earth Room
Little Theater
Star Room
Logging Room
Auditorium
Pavillion
THE FIELD
N
E
Clspus Office
Camp Office
Sasquatch Lounge
Little Foot Lair
Canteen
Dining Hall
W E
Alder
Classroom 3
Library
Classrooms 1 & 2
N S
Birch
N S
Cedar
N S
Dogwood
Health Room
Classrooms 4 & 5
W E
Elderberry
W E
False Hemlock
W E
Grand Fir
Gym



CISPUS LEARNING CENTER TRAILS

	(Each Way)
Angel Falls Trail	**1.5 miles**
Covell Creek Trail	**1.0 mile**
Braille Trail	**.33 mile**
Pond Trail	**1.0 mile**
River Trail	**.33 mile**

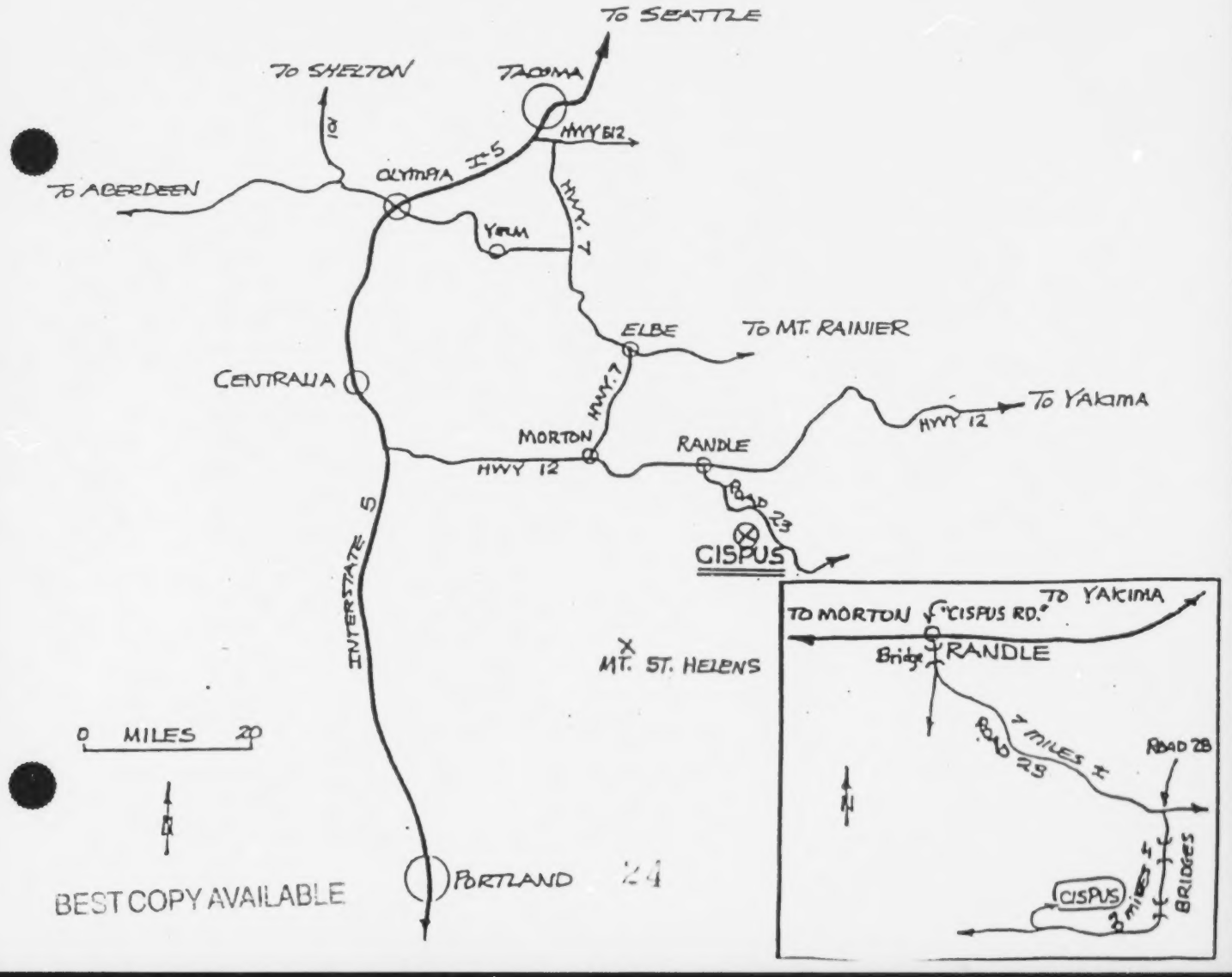
BEST COPY AVAILABLE

DIRECTIONS TO CISPUS LEARNING CENTER

2142 Cispus Road
Randle, Washington 98377
(206) 497-7131/FAX (206) 497-7132

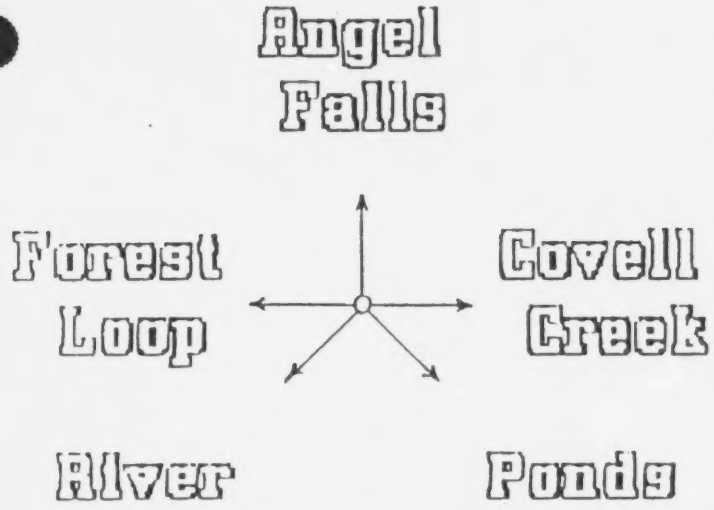
Turn east off I-5, exit 68 (highway 12, White Pass, Yakima). Follow 12 to Randle (48 miles). Make a right turn at Randle intersection (Mt. Adam's/ St. Helen's Cafe).

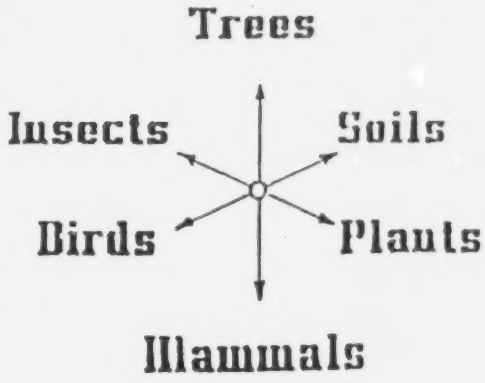
After making turn at Randle, continue on 23 and follow signs to Cispus. About a mile and a half up Road 23 you will reach a "Y" - take the road to the left. The rest of the way is well marked (brown signs on the right side of the road).



BEST COPY AVAILABLE

CISPUS TRAILS





CISPUS TRAILS

The Cispus Learning Center offers five primary trail options from which recreational walkers, serious exercisers and students of nature can select those most appropriate for their particular purposes. The choices range from relatively short, flat paths to considerably longer, uphill challenges for those seeking a more strenuous workout.

The distances listed represent measurements starting and ending at the Center's flagpole near the main office.

FOREST LOOP TRAIL...

(Flagpole to flagpole = 3/4 mile)

This level, easily-traversed path is located across Road 76 from the Center. It winds through a stand of conifers with an attractive understory of vine maple and is carpeted most of the year with the soft green foliage of the wood sorrel (Oxalis). A number of absolutely classic "nurse logs" provide teachers and students with excellent opportunities for studying cycles, succession, decomposition, plant community relationships and other significant ecological concepts. Cross-sections of old-growth logs, a sprinkling of wildflowers and Covell Creek all offer obvious invitations for scientific investigations, artistic activities and creative writing assignments.

The casual stroller will also find this a delightful area in which to spend some quiet moments in the peaceful serenity of a forest setting. The Forest Loop Trail has been enjoyed by folks of all ages, and even by some in wheel-chairs or with crutches.

RIVER TRAIL...

(Flagpole to flagpole = 2/3 mile)

This trail leads past the campfire circle, across several tiny feeder creeks, and eventually to the large gravel bar bordering the confluence of the Cispus River and Yellowjacket Creek. The sheer face of Tower Rock and other rocky outcroppings are evidence of the glacier which helped shape the river valley some 10,000 years ago. Youngsters should always be accompanied by at least one adult whenever they go to the river.

Students and teachers often conduct water studies along this trail, and make plaster casts of animal tracks found in the sand bars along the edge of the feeder streams.

COVELL CREEK TRAIL... (Flagpole to flagpole = 1 1/4 miles)

Passes through conifer stands, nurse logs with their plant communities, vine-maple understory, carpets of oxalis, scattered stands of deciduous trees and a variety of wildflowers. Leads upstream to a study shelter, and returns along the opposite side of the creek.

This is one of our most popular trails for recreationists and nature study groups. Those interested in plant identification will find Douglas fir, vine maple, broad-leafed maple, cedar, alder, salal, Oregon grape, devil's club, sword fern, wood sorrel, hemlock, huckleberry and an interesting mix of wildflowers. Cottonwoods and willows are found closer to the water down along the River Trail. Mosses, lichens and different types of fungi can be observed on any of the trails.

ANGEL FALLS TRAIL... (Flagpole to flagpole = 3 1/2 miles)

The most physically challenging, this trail leads uphill across the road from the Center toward Burley Mountain. Those who wish to avoid most of the trail's switchbacks, but still want to see the falls, may drive part way up the hill. Note on the map that the trail does cross the road twice. Angel Falls consists of a large rock face over which Covell Creek spills amid several kinds of lush green ferns and mosses.

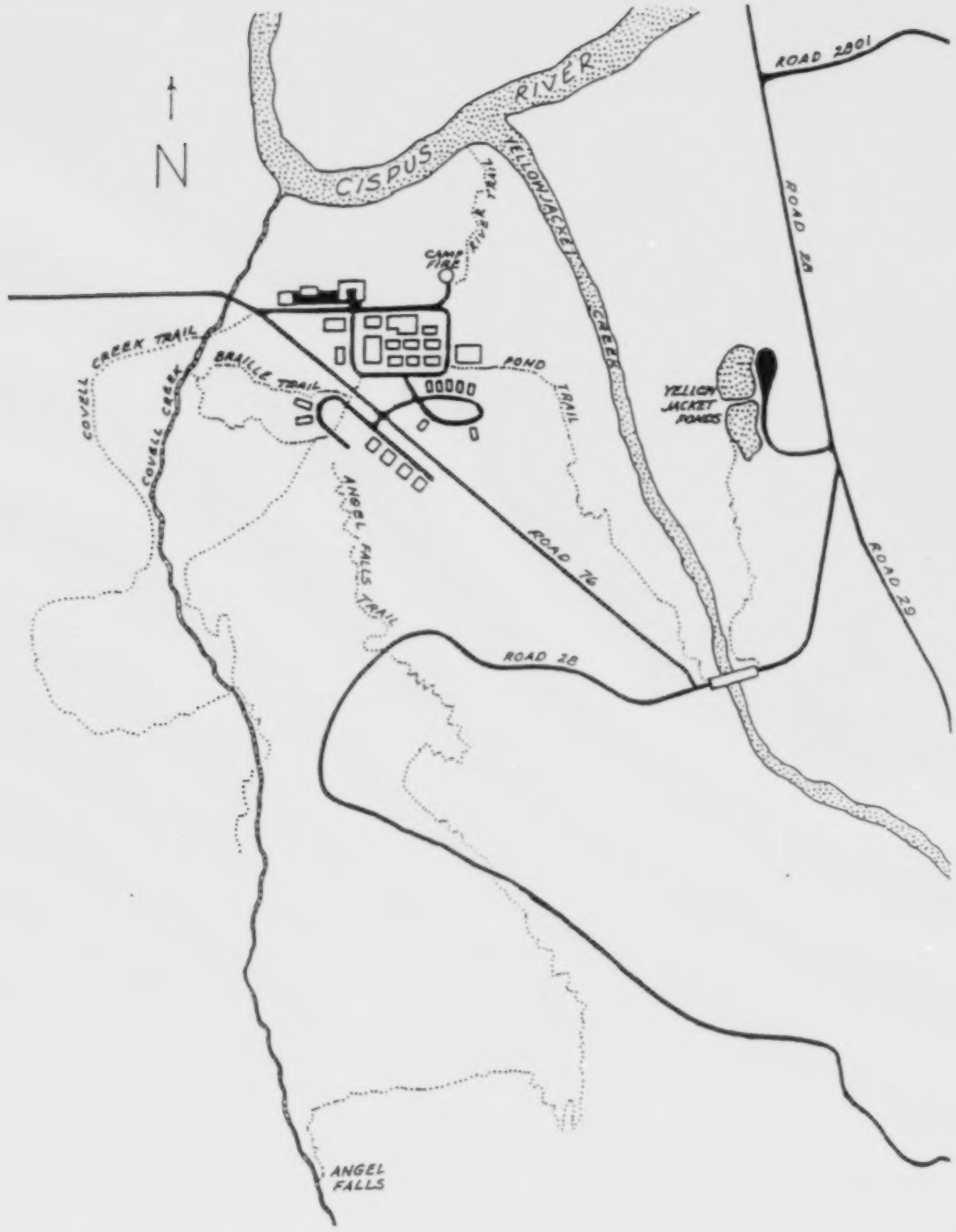
This trail does actually continue to the top of Burley Mountain, but the upper portions are accessible only after the winter's snows recede.

POND TRAIL... (Flagpole to flagpole = 2 miles)

This forest trail parallels Yellowjacket Creek back to the bridge, and then leads to the pair of Yellowjacket Ponds. These ponds serve as excellent study sites for aquatic biology investigations, and are stocked periodically with small rainbow trout. The fishing season coincides with that of Washington's upland lakes and streams.

The shoreline of Yellowjacket Creek is lined with small willows, alders and a few cottonwoods. These species are thoroughly appreciated by the industrious beavers that inhabit the area. Fresh-cut trees and limbs can almost always be found just above the waterline.

The Cispus River Valley supports a very large, highly diverse mushroom population which is much enjoyed by amateur hobbyists as well as professional mycologists.



CISPUS LEARNING CENTER TRAILS

	(Each Way)
Angel Falls Trail	1.5 miles
Covell Creek Trail	1.0 mile
Braille Trail	.33 mile
Pond Trail	1.0 mile
River Trail	.33 mile

BEST COPY AVAILABLE

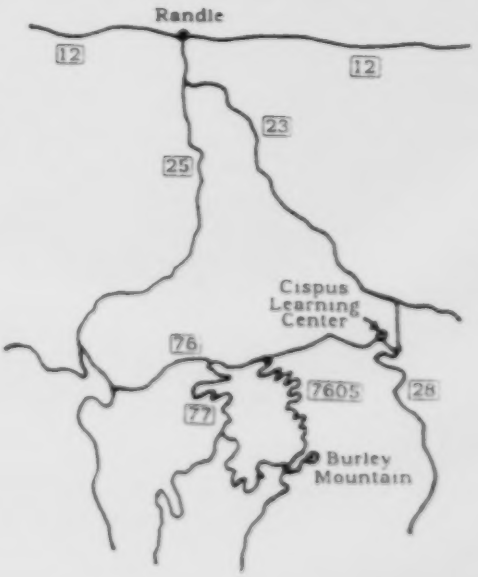
BURLEY MOUNTAIN

Visitors to the Cispus Learning Center soon notice two very prominent geological features overlooking the 45 acre center. To the southwest, Tower Rock looms some 2,000 feet above the Center which is situated on the broad Cispus River floodplain approximately 1,300 feet above sea level. On the highest portion of the skyline directly to the south appears a rather small rectangular building, a bank of photoelectric cells and communication relay antennae all of which are components of a fully functional fire lookout station atop Burley Mountain. This is one of only three active lookouts remaining on the Gifford Pinchot National Forest. The summit of Burley is just over 5,300 feet above sea level, approximately 2,000 feet higher than the top of Tower Rock and 4,000 feet above the Center.

The view from the crest of Burley Mountain is absolutely spectacular. To the southwest lie the remains of Mt. St. Helens; to the north lies Mt. Rainier; to the east lies Mt. Adams and on clear days Oregon's Mt. Hood is easily observed on the southern horizon. The tree-clad hills and rocky outcrops of a major share of the Gifford Pinchot National Forest are truly awesome in their own right, as are the snow-capped peaks of the Goat Rocks Wilderness Area to the east. Riffe Lake to the west, the Cispus Learning Center, nearby Randle, a patchwork of clear-cuts, a variety of wildflowers and huckleberries in season and occasional sightings of grouse, deer, elk, hawks and other wildlife all contribute to the memorable qualities of a visit to the top of Burley Mountain. Sunrises and sunsets on relatively clear days are almost spiritual experiences. Most observers report feeling a humbling sense of personal insignificance along with a definite awareness of what a privilege it is just to be a part of such a magnificent system.

There are two routes by which one can drive from the Cispus Center to the parking area just below the summit of Burley. One is via Road 77, and the other is via Road 7605. Road 77 is the more civilized, though it is 17 miles from Road 76 to the top. It has a blacktopped surface for the first 5 miles, then is a typical graveled Forest Service road to within a mile or two of the parking spot. The last stretch of road is dirt surfaced or graveled, narrow and steep. Turn left off of Road 76 about 3 miles west of the Cispus Center.

The trip to the top via Road 7605 is only a little over 7 miles, but is narrow, graveled half way (remainder dirt surfaced) and has many tight switchbacks. Turn left off of Road 76 just over 2 miles west of the Cispus Center. Both routes share the last mile or two. Neither road requires a four-wheeled vehicle, but neither is recommended for buses and other large vehicles or particularly low-slung cars.



BEST COPY AVAILABLE

Cispus Videotape Inventory

December, 1992

12 Angry Men 96 minutes
Courtroom drama, starring Henry Fonda.
(MGM/UA)

A Rage Over Trees 50 minutes
Addresses controversy between conservationists and lumbermen concerning our remaining old growth forest resources.
(Audubon)

After the Warming-Part One 55 minutes
Addresses the greenhouse effect and its possible results.
(Ambrose Video)

After the Warming-Part Two 55 minutes
Looking back at the 1990's from the year 2050 and the consequences of increased air temperature, rainfall, deforestation, shifts in weather patterns, and the impact of global warming on the food supply.
(Ambrose Video)

Audubon's Video Guide to Birds of North America
5 tapes
(Audubon)

Bird Watching 15 minutes
Techniques for attracting and watching birds.
(West Wind Productions)

Black Footed Ferret 60 minutes
Endangered ferrets "at home" and the efforts of people to save them from extinction. Loretta Switt narrates.
(Audubon)

Bottom of the Barrel 30 minutes
3-2-1 Contact provides an entertaining way to learn about oil from top to bottom.
(Childrens Television Workshop)

By Nature's Rules 24 minutes
Survival in a mountain setting.

California Condor 60 minutes
Efforts to save the condor from extinction and rare flight footage. Robert Redford narrates
(Audubon)

Cispus Dining Hall Management 49 minutes
(Kelso School District)

Cispus Orientation 22 minutes
(Jim Garner)

Climb the High Winds 18 minutes
Human efforts to save Peregrine Falcons. Segments showing the techniques used by The Peregrin Fund and The World Center for Birds of Prey to raise, release, and study these

birds.
(Echo Film Productions)

Dangerous Plants 10 minutes
Shows the possible dangers of many common wild and domestic plants.
(West Wind Productions)

Down the Drain 30 minute
3-2-1 Contact dives right into facts about our water supply.
(Childrens TelevisionWorkshop)

Fabulous Wetlands 7 minutes
A humorous introduction to wetlands.
(E.P.A.)

Future of Wildlife 15 minutes
Wildlife requirements of a quality living space with food, water and shelter.
(West Wind Productions)

Grizzly and Man 60 minutes
Managing bear activities in our national parks. Robert Redford narrates.
(Audubon)

How to Fish for Trout 30 minutes
Trout fishing tips from the experts.
(West Wind Productions)

In These Ancient Trees 35 minutes
Forests of the Pacific Northwest: their beauty, the threats to their existence, and the people working to preserve them.
(National Wildlife Federation, Windstar Foundation)

Layser Cave 20 minutes
Excellent orientation for use prior to, or following, a trip to Layser Cave.
(Janet Healy Production)

Mountains Don't Care 20 minutes
Survival in a mountain environment

Mt. St. Helens: The Turmoil of Creation 90 minutes
Volcanic eruption, aerial photographs, Spirit Lake and mountain devastation, inside the crater, national interpretive programs, Port of Longview, and the Gifford Pinchot National Forest.
(Panorama)

Mt. St. Helens, A Living Laboratory 20 minutes
(U.S.F.S.)

Over Washington 60 minutes
An airborne journey through the beauty, history and personality of Washington State.
(KCTS)

Panthers and Cheetahs 60 minutes
Big cats in peril: Florida Panther and Cheetah. Loretta Switt narrates.
(Audubon)

Sea Turtles 60 minutes
Addresses the problems of poaching, pollution and destruction of nesting beaches; and suggests some solutions. Jane Alexander narrates.
(Audubon)

Smart Choices
Resource and teachers guide for energy conservation
(Texaco)

Solutions Unlimited
"Hey, Wait, Think", "The Great Canoe Race", "Plan Ahead", and "Letters From the Past".

The ABC's of Compass and Map 25 minutes
Easy to understand, step-by-step instructions on the use of map and compass.
(Brunton)

The Dam Builders 30 minutes
Compares environmental impacts of dam building by man and beavers.

The Lorax 24 minutes
Dr. Seuss cartoon concerning the importance of caring about the conservation of natural resources (trees, in this instance).

The Rotten Truth 30 minutes
3-2-1 Contact gives kids the real scoop on garbage.
(Children's Television Workshop)

This Place In Time 24 minutes
The 1980 eruption of Mt. St. Helens
(U.S.F.S.)

Whales 60 minutes
The consequences of over-hunting, conservation efforts, underwater footage and action shots. Johnny Carson narrates.
(Audubon)

Wild Edible Plants 17 minutes
Harvesting and uses of wild plants. Stresses safety.
(West Wind Productions)

Wildlife-An American Heritage 14 minutes
Historic facts and the basic concepts of wildlife management.
(West Wind Productions)

Wilderness-An American Ideal 15 minutes
America's changing attitudes about wild places.
(West Wind Productions)

You Can't Grow Home Again 60 minutes
3-2-1 Contact presents a kids-eye-view of rain forests.
(Childrens Television Workshop)

***An extensive selection of environmental films is also available at Cispus. Ask office staff for the catalog.**

Cispus Learning Center

COUNSELOR HANDBOOK

2142 CISPUS ROAD

RANDLE, WASHINGTON 98377

1992

Dear Counselor,

Congratulations! You have been paid a very fine compliment in being selected to serve as a counselor to younger students here at the Cispus Learning Center. It means that you have been identified as one who can accept responsibility, exercise leadership, serve as a role model and provide the friendship, guidance, patience and understanding required to ensure that boys and girls have a positive, happy and productive experience during their stay at the Center. Your enthusiasm, compassion, maturity and common sense will all play key roles in determining the success of your group's program. You are face to face with a great opportunity for personal development and for demonstrating that the trust shown in you has been well placed. Go for it!

COUNSELORS REALLY COUNT!

Student counselors play very significant roles in most educational programs at the Cispus Center. You matter! You are the ones who must establish a positive, trusting, friendly rapport with the younger students to which you are assigned. The cultivation of this critically important rapport demands more patience, caring and tolerance than are usually required of teenagers, but seeing the individuals in your group blossom under your guidance is a most rewarding experience and certainly worth your best efforts. Boys and girls need to know that they can depend upon, and confide in, their own particular counselor. In just a few days these special little sub-groups often become very close, and this closeness not only facilitates, but is essential to, the youngsters' successful involvement in the wide variety of living and learning experiences to which they are exposed during their stay at the Cispus Center.

The social development of the youngsters in your care is every bit as important as their academic activities. Helping young people to become well-adjusted, happy, productive citizens is among the general goals of all educational programs, and building self/peer-respect, experiencing some success in learning activities and establishing themselves as worthwhile members of their group are all essential to attaining such goals. Learning to cooperate and communicate effectively with their peers, counselors and teachers is of obvious importance to the personal development of every boy and girl. Anything you do as a counselor to maximize the benefits your charges realize from their Cispus experiences will be much appreciated by all concerned even if it does not get the recognition it deserves.

GETTING OFF ON THE RIGHT FOOT

"You never have a second chance to make a good first impression." Therefore, immediately let your charges know what you expect of them and what they can expect from you. Do this is a non-threatening manner which lets them know you are a real friend who will help and lend support at the same time you expect them to cooperate cheerfully, follow instructions readily and make a personal effort to contribute as best they can individually and collectively.

Greet your students with enthusiasm, pride and determination. Let them know that you are happy to be their leader. Encourage their feelings of unity and pride in their group. Foster an open-minded honesty and discuss with them the importance of cooperating and showing consideration of others if their Cispus stay is to be happy and productive for the entire group. There are few things more contagious than a good example, so do your best to be exactly that. Being fair and consistent will, of course, pay off in many ways. Cultivate group-cohesion at every opportunity.

Make certain that all of your students know each other through more than formal introductions. Use your imagination, consult a New Games book or ask an instructor how to make all participants comfortable group members via some type of game format or "ice-breaking" activity.

Involve your students in helping to set up ground rules for acceptable behavior in the dormitories, the dining hall, the classrooms and outdoors around the campus. Compliance and cooperation are more likely when all have had a hand in laying out the rules. Make certain that each boy and girl in your keeping understands exactly what you expect of them. Being where they are supposed to be when they are supposed to be there is vitally important. You can also head off any number of potential disciplinary problems by communicating clearly and fairly. This is not a Marine Corps boot camp, but there does need to be a common understanding that a well-planned, carefully organized program is being implemented under the guidance of qualified teachers and capable, caring counselors. Cultivate a team feeling of cohesion and pride within your group.

JOURNAL KEEPING

Journals are notebooks kept by each individual in which many kinds of information are recorded. Their purpose is to help students derive maximum benefits from their learning and living experiences at the Center. Teachers may make journals an assigned responsibility to be turned in later, or may prefer that each student have a private journal that he or she can decide individually whether or not to share with others. Journal contents usually include notations and sketches, of course, but could also have anything else which the student feels will help remind them of discoveries and observations made during their stay. Journals are not ordinarily subject to spelling and grammar corrections or teacher grading. They are just useful tools for reinforcing a wide variety of learning experiences.

Some groups choose to have a "quiet time" each evening to allow students to reflect on the day's activities, and to record their experiences. Since holding "quiet times" results from a group decision made when you are laying out general behavioral guidelines, all members should be expected to comply and to cooperate fully. Visiting and rough-housing are not permitted during quiet times. Use your own discretion as to the duration of such periods as this; younger students get pretty restless in a short time. Twenty to thirty minutes seem to work rather well for most groups. Quiet times can be spent wherever you feel it would be best for your particular students—often in the dormitory, but could be outside.

If journals are to be kept, then appropriate materials must be purchase prior to your arrival at Cispus. Teachers can involve students in the selection and design of their journals. At Cispus, counselors should see that each of their charges puts their name on their notebook covers in case they are misplaced. Many students enjoy sharing their journals with their families at the completion of the Cispus program since it serves as a helpful log of many of the things they did here.

GROUP INTERACTION

Make a conscious effort to provide opportunities for your students to deal individually and collectively with their feelings, problems and personality differences. Evening sessions can sometimes help with this. You may not need, or want, to meet every evening on these matters, but this is a good strategy for identifying potential trouble spots and resolving them before they cause serious concern. Listen, more than lecture. Be patient, but compassionate in letting your youngsters know you really do want to help them through the tough spots. Their problems may seem petty and silly to you, but they are real to them, so give them a helping hand.

An effective approach to group sessions is to place your participants in a circle close enough to ensure eye contact and to make certain that everyone hears what is said. Be sensitive to the natural reluctance of many boys and girls to openly express their true feelings. Patience and sensitivity pay big dividends. Encourage, rather than force, participation. Make it clear that they are not to interrupt one another, put anybody down or make fun of anyone. Homesickness, cliques, indifference, resentment and personality clashes can all be addressed in sessions of this sort. It's a great chance to teach the necessity of having tolerance for others who might think, act, talk and dress differently than we do.

COUNSELOR'S ROLE IN THE LEARNING PROCESS

Self-confidence and emotional security are vital to effective learning. Anything you can do to help your charges feel good about themselves, feel that it's perfectly all right to make an occasional mistake, feel that they are respected members of their group and feel that learning is important enough that they will give it their best shot is going to be most helpful. The following are some suggestions that should help:

Show them you believe they can actually accomplish the task or handle the assignment.

Encourage them to really try.

Find opportunities for students to succeed (to reinforce their self-esteem and confidence).

Set reasonable and appropriate goals and performance expectations.

Accept students as they are, but encourage their efforts to improve what they are.

Learn names as soon as possible, and use them.

Make eye contact with those with whom you are talking.

Challenge each youngster to think, and apply him/herself.

Involve all members in planning and in all activities as much as possible.

Set a good example. Like it or not, you are going to be a role model for those in your charge.

Try to make every student feel important and worthy members of your group.

Don't permit more aggressive students to dominate others.

Always be fair and honest in your dealings with students...even if it isn't easy some times.

Express appreciation for your group's cooperation, fine efforts and accomplishments.

Do everything you can to ensure that your students really do enjoy their stay at Cispus.

Demonstrate your faith and confidence in students whenever you have the opportunity.

DISCIPLINE

Disciplinary problems typical of a regular classroom or schoolyard are much reduced when students come to the Cispus Center. The chance to branch out from the confining four walls of their school's classrooms provides a unique sense of freedom and excitement. Boys and girls are delighted to be here, and are usually on their good behavior, so disciplinary problems are minimized. They do exist at times though, and need to be appropriately resolved. Reminding groups that poor deportment could ruin the chances of groups from their school coming to Cispus in the future impresses some, but not all.

Providing a positive, dependable role model helps to cultivate constructive attitudes and helps forestall unruly student behavior. Be as "upbeat" as you can. Try your best to be cheerful, friendly and fair at all times. That will put most of your charges on your side to start with. Be aware too that some behavior requires an adult , don't let your pride prevent you from involving the teachers.

If one person's actions begin to make others unhappy or interfere with the group's activities, some form of discipline is appropriate. Be certain all of your charges understand what the rules are and what is acceptable, then take a firm stand when someone goes too far. Indecisiveness invites youngsters to test the limits of what is permissable, but remember that you are dealing with very young boys and girls so do not be overly harsh. Avoid using physical force. It probably is not called for, and is a clear indication that you are no longer in control. Continuing discipline problems with a particular student should be discussed with your supervising teacher, and severe problems must be referred to the program director.

GROUP BEHAVIOR

The effectiveness of a group's interactions is largely determined by how the individuals perceive themselves and the group, by how well they communicate, by their collective interest levels and by how well they all understand what is expected of them. The need to dominate and for attention and approval are very strong in some. These needs may seriously interfere with the personal development of other group members and with the achievement of group goals if you permit them to do so.

Groups tend to reject thecontributions of people whom they dislike, and accept even inferior contributions from those they like. Some personalities vie for positions of leadership. There are often differences in cultural and family backgrounds which result in conflicting points of view, and need to be dealt with so as not to interfere with the group's progress.

Successful group work requires at least two kinds of skills: (1) those required for the particular activity, such as making posters to persuade or inform and (2) the ability to work together. The latter include abilities to listen attentively, to express one's ideas clearly and concisely relevant to what is under consideration, to defuse potentially tense situations, to emphasize the positive contributions of others, and the ability to coordinate various points of view.

PROBLEM SOLVING IN A GROUP

If a group is to have a successful experience working together, there must be a procedure for resolving the problems that inevitably occur. Problem solving starts with the identification of the problem.

All members may not agree that they even have a problem, and various individuals will have different perspectives to bring to bear. You, as counselor, will often have to act as moderator in helping the group identify their problem, helping them to consider possible solutions and then helping them to resolve whatever is bothering them.

There are many approaches to problem-solving, but one effective strategy involves the following four stages:

(1) Recognizing the problem: Chances are good that you will be very aware that a problem is developing within your group. When you detect the need for your group to deal with a problem, you should tackle the task of focusing the members' attention on it.

Example:

Earlier in the day the group took a hike to Angel Falls. While there, several of your students ran into the water with their shoes on. Hopefully, a discussion took place at the time whereby the students were helped to realize the poor judgment exercised in their decision to go wading.

Now the group has returned and it is time for a sack lunch. Half the group wants to eat outside because the sun is shining and it is a beautiful day. The other half wants to eat inside. A group consensus is needed since you want your charges to stay together. Everyone is aware at this point that a problem exists.

(2) Diagnosing the problem: As the leader, your job will be to help your group identify the nature of their problem and its possible causes. In this example, you would focus on the wet feet. You might say, "it's interesting to me that the people who choose to eat inside happen to be the same people who ran into the water this morning. Would the fact that you are now uncomfortable with your wet feet have anything to do with your decision to eat inside?"

(3) Decision making: Nearly all problems have a number of effective solutions. You may decide to help your group realize that those with wet feet are willing to deprive the rest of the group because of their poor judgment earlier. Once the group grasps the situation, they need to reach agreement upon which way to go. The wet feet folks may opt to join the others outside for lunch as a consequence of their actions at Angel Falls. It may be that the others will decide to eat inside so the people with wet feet won't have to be uncomfortable. The important thing here is that the final decision comes from the group and all accept it as fair and reasonable.

Don't solve problems by flipping coins or drawing straws. In doing so, you deprive your charges of a valuable learning experiences in decision-making and problem-solving.

(4)Accepting and carrying out decisions. This final stage involves the implementation of the group's decision. People will be more likely to accept and carry out a course of action if they have had a part in deciding on the particular solution.

In dealing with problem situations try to remain non-judgmental. Avoid dictating solutions when you can turn a situation into a learning experience by involving students in the process. This helps develop self and group respect, tolerance for differing opinions, respect for others and a better understanding of how to get along with others.

POTENTIAL PROBLEM AREAS

HOMESICKNESS: You'll undoubtedly detect this with one or more of your students at some time during your stay at Cispus. This is often the very first time some girls and boys have been away from home for several nights running, except maybe for going to their grandparents' or other relatives. Encourage openness in such feelings so that you can deal with them effectively. Be fully supportive in assuring youngsters that it is a perfectly normal feeling which almost all of us have at some time or other. Cultivate peer support too in helping the homesick to feel better. Consider activities like the "Train" (sitting in line with each giving the one in front of them a gentle massage), or the "Trust Circle" as used in the low ropes course and New Games programs.

CLIQUES: This problem can usually be minimized if you have developed a general feeling of group pride and cohesion from the outset. If you observe that anyone is being intentionally ignored or excluded from group activities, you'll want to deal with it. Let the group know what you have noticed. Involve them in a discussion concerning the importance of feeling accepted, and of being a respected member of the group. Impress them with the need to be sensitive to the needs and feelings of others. Try to get them to identify the clique, and to explore the reasons for it having
formed. Remind them that everyone is considered to be an equal and that all should be made to feel a part of the group. Ask those who have been left out to share their feelings with the group. Urge them to be open and honest about how it can hurt to be rejected or excluded. You may want to devise an activity which will help the clique members to understand how it feels to be left out.

AVOIDING WORK AND STUDY ASSIGNMENTS: Make it very clear that everyone is expected to accept responsibility for cleaning up, taking their turn at dishwashing and keeping up with their study assignments. Deal with offenders within the whole group by discussing the adverse effects their lack of cooperation can have. Remind them that one of the main objectives of coming to Cispus is to teach students to accept responsibility. You might point out that carrying out work assignments responsibly is a good way to show their appreciation for the privilege of being here. Build on the concept of teamwork, and try to instill a desire to be effective group members.

BED WETTING: This is a common problem at this age level. Show real patience in dealing with these situations. There are many causes for bed wetting, you'll need to be quite sensitive to the embarrasment and frustration that it causes and avoid making the student feel even worse.
Try getting him or her up every night for a bathroom run about one hour after retiring. During breakfast, sneak back to the dorms and check everyone's bed. If there is a wet sleeping bag, remove it and replace it with your own. Then take the wet bag to the laundry room and wash it.

REFUSAL TO EAT WHAT IS SERVED: Hold group discussion of the importance of a well balanced meal and the need to eat properly, especially when busily engaged in a very full daily schedule. A poor diet or actual hunger can have an adverse effect upon a youngster's general behavior. Disparaging remarks concerning the quality of food have a contagiously detrimental effect upon the appetites and eating enjoyment of others. Setting a good example in your enthusiastic acceptance of the menu is important .

TABLE ETIQUETTE: Hold group discussions regarding proper table manners. Remind them that others are watching them, and use their group pride as a lever for proper deportment. Some youngsters simply do not know correct table manners, so you may have to give them some instruction.

HIKING TIPS: Before taking your first hike, involve your students in a team consideration of how they should behave on the area's five trails. Student safety, litter control, environmental protection, plant community integrity and erosion control are all key factors. The Cispus Center has established suggestions for hikers:

(1) Stay on the trail! Wandering off trails destroys wild plants and degrades the environment. Injuries are much more likely when students are allowed to stray off trails. Do not allow your students to "shortcut" switchback corners; it causes serious erosion problems.

(2) Do not pick wildflowers or uproot young plants.

(3) Do not litter; please pick up whatever litter you may encounter and bring back to receptacles.

(4) Do not build survival shelters along the Center's trails. Such practices take students off of trails, are tough on tender plants and degrade the area's appearance.

Keep your people together at all times in order to avoid anyone getting lost. Have students help one another over some of the tougher spots if necessary. Never throw or kick anything while on a hike; to do so could cause injury or damage to another person, to wildlife or to the environment. Designate your slowest hikers as pacesetters. As a safety precaution, you may want to make one person your "sweep" who is responsible for stopping the group if anyone falls behind or stops for any reason. Involve as many as possible by rotating such assignments among your students.
Avoid loud, boisterous activities while hiking. It is frightening to wildlife, and reflects no credit whatsoever on the people involved. You may want to take a first aid kit along

on your hike.
Appropriate clothing is very important for those heading out on the trail. You should make a personal inspection of your charges' protective gear. Ill-fitting shoes can cause painful blisters which can often by avoided by applying moleskin before blisters become a problem.

SNACKS: On behalf of good nutrition, and to help minimize campus littering, groups are discouraged from bringing traditional snacks and "junk food" to the Center. If group directors feel that fruit/cookie/milk-type snacks are important to their programs, they can make special arrangements for same on the appropriate forms. Such arrangements need to be made prior to your arrival so that materials can be ordered, delivered and prepared before they are actually needed.

WHAT TO BRING

The length of your stay, the nature of your program activities, the season of the year, the vagaries of the weather as well as your personal needs and preferences all will obviously dictate what you should bring to the Cispus Conference and Learning Center. The following list may help you make decisions.

A. Sleeping bag or blankets, sheets and pillow.

B. Toilet Articles:
Hand towel
Bath towel
Washrag
Soap in appropriate container
Toothbrush and toothpaste
Comb or brush
Shampoo
Hand lotion

C. Clothing
Complete change of outside clothing such as shirt, pants, shoes, etc.
Pairs of socks (one for each day + one)
Changes of underwear
Warm jacket
Pajamas
Extra sweater or sweatshirt
Rain gear

D. Useful Items
Camera
Pen or pencil
Alarm clock and watch (leaders)
Flashlight
Insect repellent
Lip balm
Sun glasses

THE CISPUS EXPERIENCE...ENCORE

A companion to THE CISPUS EXPERIENCE, Curriculum Guide

Cispus Curriculum Writing Team January, 1994

Linda Marie Arthur
St. Mary's School
Arch Dioceses of Seattle, Aberdeen

Chuck Bergquist
Columbia Heights Elementary
Longview School District

Roy Carlson
Mill Pond Intermediate
Yelm School District

Joe Fenbert
Cispus Learning Center
ESD 113

Mike Gullickson
Cedar Heights Junior High
South Kitsap School District

Bill Hickle
Garfield Elementary
Olympia School District

Carol Kegel
St. Mary's School
Arch Dioceses of Seattle, Aberdeen

Jane Poole
Mill Pond Intermediate
Yelm School District

Linda Lee Tatro
Mill Pond Intermediate
Yelm School District

Terry VanMeter
East Olympia Elementary
Tumwater School District

Ron Ward
Union Ridge Elementary
Ridgefield School District

Kathy Wilkes
Hudson Park Elementary
Rainier,Oregon School District

Cispus Intern Writing Team Spring and Fall, 1993

Jill Anagnos
Audubon Expeditionary Institute

Julia Shipley
Audubon Expeditionary Institute

Teresa Santord
Washington State University

Project Editor
Lorene Santord
Technical Writing Consultant
Center

Assistant Editor
Jim Garner
Program Coordinator, Cispus Learning

Project Coordinator
Martin E. Fortin, Jr.
Manager, Cispus Learning Center

1994 Cispus Learning Center

The Cispus Experience...Encore

Table of Contents

Starry-Eyed

(the blue section)

stars, constellations, heavenly bodies

Title	Focus	Time	Pp.
Create A Constellation	identifying & creating constellations	40 min	B1-3
Lunar Lookout	phases of the moon	30 min	B4-5
Meteor Shower	meteor shower observation	20 min	B6
Night Sights	constellation identification	1 hr	B7-10
Way Up North	polar constellations, mythology & history	1 hr	B11
Written In The Stars	five polar constellations & their legends	1 hr	B12-14

Wear-It-Away

(the orange section)

rocks, plants, soil, and the effects of time and nature

Title	Focus	Time	Pp.
Chewy Conglomerates	create an edible sedimentary rock	30 min	O1
Chip Off The Old Rock	affects of weathering on rocks	30 min	O2
Clearing The Muddy Waters	sedimentation as flip-side of erosion	20 min	O3
Crack, Crumble & Carry	weathering, erosion & deposition	1.5 hrs	O4-10
Down & Dirty: Soil Profile	make up of soil layers	1.5 hrs	O11-12
Nowhere To Run	erosion & plants	30 min	O13-14
Reading The Landscape	glaciers & the Cispus Valley	1 hr	O15-16
Thar's Gold In Them Hills	recreational geology	30-60m	O17
What Dug This?	natural forces & the Cispus Valley	1-2 hrs	O18

Local Landmarks

(the purple section)

local points of interest that are no farther than a day-trip

Title	Focus	Time	Pp.
Finding Your Way On Mt. St. Helens	Mt. St. Helens Volcanic Monument	30-45m	P1-2
Last Indians In Layser Cave	story & archaeological discoveries	1 hr	P3-10
Light In The Dark: The Braille Trail	forest ecology	1.25hrs	P11-13
Mt. St. Helens 2000	a time-line of recovery for Mt. St. Helens	1.5hrs	P14-15
Mt St. Helens Eco-Comparisons	ecosystems of 3 Mt. St. Helens areas	6-6.5hrs	P16-24
Physical Relief At Cispus	features of the Cispus area	3hrs	P25
Pinto Rock: Volcanic Plug	Cispus area mountain origins	2.5hrs	P26-28
Silent Voices, Vital Clues	Layser cave w/o the visit	40min	P29-30
Stone Age Tool Making	flint knapping & Layser Cave inhabitants	1-2hrs	P31-32
The Dig	appreciation of archeology	1hr	P33-35
Where Was That?	mapping the Braille Trail	1hr	P36

Careful Consideration

(the red section)

safety and survival tips

Title	Focus	Time	Pp.
Aiming For Safety	Archery safety practices	10min	R1
Be Prepared, Or...!?	traveling with survival materials	20-50m	R2-4
By Nature's Rules	dangers of traveling unprepared	1hr	R5-7
Hang On!	controlling fear in survival situations	45min	R8
Survival Simulation	applying survival techniques	2.5hrs	R9-11

Make It Last

(the yellow section)

resource use and responsibility

Title	Focus	Time	Pp.
Bradston: City In Need	water resource use	2hr	Y1-7
Endangered Species: Whose Fault?	reasons behind species endangerment	30-40m	Y8-9
Focus On Freedom	self-sufficient lifestyle	2.5hr	Y10-11
Foresters Log Trees, Right?	what foresters do	40min	Y12-13
Future Of Wildlife	wildlife threats, management, & history	1hr	Y14-16
No Power? No Problem.	living w/o externally supplied electricity	2.5hr	Y17
Stomped To Death	foot traffic and wilderness	1.5-2hrs	Y18-19

Threads In The Web

(the green section)

the interconnectiveness of the elements in an environment

Title	Focus	Time	Pp.
Birds Of A Feather	Feathers as a means of adaptation	20min	G1-2
Critter Coping	methods of adaptation	1hr	G3-5
Everybody's Gotta Eat	food chains	30-45m	G6-7
In These Ancient Trees	biodiversity & old growth	1hr	G8-10
Known Cones: A Key To Conifers	simplified dichotomous key	30min	G11-14
Me And Your Shadow	sunlight tolerant & intolerant plants	1hr	G15-16
Mowitsh, Salal,Pish	Nativie Americans, environment, & food	1.5hrs	G17-18
Small Aquatic Animals In The Cispus	insect larvae in the Cispus	1.5-2hrs	G19
Take A Liken To Lichen	lichen in the forest ecosystem	20min	G20
The Inbetween Places	diversity, plant succession & elevation	2.5hrs	G21-22
Transition Walk	plants and water proximity	1.5-2hrs	G23
Uniformity And Diversity	uniformity & diversity of plants	30min	G24

The Kitchen Sink

(the limegreen section)

lessons that didn't quite fit anywhere else, but they're still real neat

Title	Focus	Time	Pg.
Bird On A Stick	make a study skin (instructor use)	3hrs	L1-4
Cispus Dawn	creative writing	20-30m	L5-6
How Far Did Your Breakfast Travel?	importance of locally grown food	1hr	L7
Indoor Campfire	campfire in the Star Room	1-2hrs	L8
The Big Picture	create a holistic view of what you've learned	1hr	L9
Unnatural Objects Trail	observation practice	15-20m	L10
Up To Now...Reflections On The Day	reflect on feelings and learning	15-20m	L11-12
Weather Scavengers	affects of weather	1hr	L13-14
Weather Watching	taking measurements & forecasting weather	varies	L15-18

Starry-Eyed

CREATE A CONSTELLATION

Focus To recognize specific constellations, rename and draw new figures based on its new name.

Group Size No more than 25

Time Required 40 minutes

Materials
Compass
Constellation Wheels
Handouts:
What Stare Are *(pB8)*
Shortcut To The Stars *(pB9)*
Create a Constellation

Physical Setting
Cispus Star Room
Cispus field near the Pavilion, or parking area adjacent to the Cispus community Volunteer Fire Station *(located 1/4 mile down Cispus Road towards Tower Rock Campground)*

Process

Activity 1: CREATE A CONSTELLATION

1. Figure out how to operate the light switches before the students enter. Note locations of both doors before turning room lighting off.

2. Have your group enter the Star Room with normal lights on only (the dimmer switch open all the way). The walls are covered with actual enlarged photos of areas around the Center. It's a pleasant setting just as it is. (suitable for creative writing!)

3. Review ***What Stars Are***, and use of the "Constellation Wheel".

4. Position the group facing North, and hold the Constellation Wheels with the current month pointing north. (It won't be a perfect match-up due to the obvious--the star locations on the ceiling of the Star Room don't change.)

5. Turn on the ultra-violet light switch; soon the students will see stars appear on the ceiling. Some may even pick out specific constellations.

6. Review how the ancient Greeks named the constellations thousands of years ago based on mythological beliefs of their gods' activities.

7. Now turn down the regular light's dimmer switch gradually (to simulate dusk) till it's all the way off.

8. Have the students begin to identify specific constellations using a Constellation Wheel, and ***Shortcut To The Stars***.

9. Have the group choose a constellation and do, ***Re-naming the Constellations***, activity. This activity can be done outdoors too, at the two locations mentioned above in "Physical Setting. Make sure ultra violet lights are on for this activity.

10.Have the whole group now sit on the floor; and leave the door ajar (just a crack).

11.For a special treat turn off the ultra violet lights. This is what the sky looks like on a clear night with a new (no) moon.

Extensions:
1.Use some of the Cispus cassette tapes and without using the ultra violet light respond to feelings, or sounds. (see activity, ***Cispus Dawn***)

2. Have students place themselves bodily into one of the pictures and describe...whatever you or they want to.
3. Have students become something in one of the pictures (or something you would expect to normally see in one of the pictures), and write,...."A day in the life of_____ ." It can be a whole day's account or season or even a whole year.

4. Students could create their own universe, renaming and re-drawing the shapes of all the constellations seen at a given time.

Create A Constellation

Choose a particular constellation group that appeals to you.
1. Give the accepted Greek name for your constellation, and write it below.

_____

2. Draw the pattern of stars of your constellation. Then connect the primary stars with straight lines. Now draw the surrounding outline of the Greek figure that goes with it in the space below. (Or, describe in detail what the constellation is "supposed" to depict.)

3. Now use your imagination: picture your constellation depicting something much different than its original name suggests (maybe even more contemporary--like pizza) . RENAME your constellation on the next line.

_____

Draw your newly named constellation in the space below. First, indicate key stars with "*'s" and, "x's," then name the stars with a name consistent to the name you gave the constellation. Connect the primary stars with straight lines, then draw the general outline of your constellations figure using a dashed line.-----

4. Now think of your favorite thing to draw. Picture it only as a "stick figure." Draw this "stick figure" below and show the main indicator points (as in question 3, using "*'s," and, "x's"). Again, with a dashed line ----- draw in its general shape. Your name for this constellation is_____

Draw it in the space below, or on the back, following the guidelines given above.

B3

LUNAR LOOKOUT

Focus To observe the phases of the moon.

Group Size Entire class

Time Required 30 minutes

Materials ***Earth's Satellite***

Physical Setting Outside the Star Room
Field in front of the Pavilion

Process

Introduction:
Begin with an introductory lesson on the moon. ***Earth's Satellite*** contains basic facts about the moon to help you out.

Activity:
1. Begin in the auditorium. Just outside the Star Room is a poster displaying the phases of the moon, let each student read and study this poster.

2. Next, move outside to the large field. Study the moon and have the students decide which phase they believe the moon is in.

3. As a group, reach consensus about the current phase of the moon.

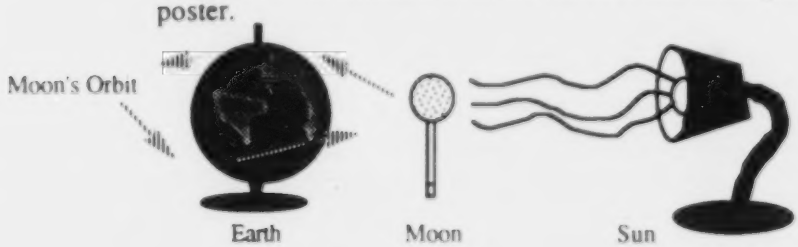
Discussion Questions:
A. At what side or angle are the sun's rays hitting the moon?

B. What phase will the moon move into next?

C. How will the moon appear then?

D. Where will the ray's of the sun be hitting the moon at that time?

Extension:
Using a globe, small lamp, styrofoam ball and pencil, make a model of the Earth, Sun, and Moon that will graphically illustrate the information from the handout and moon phases poster.

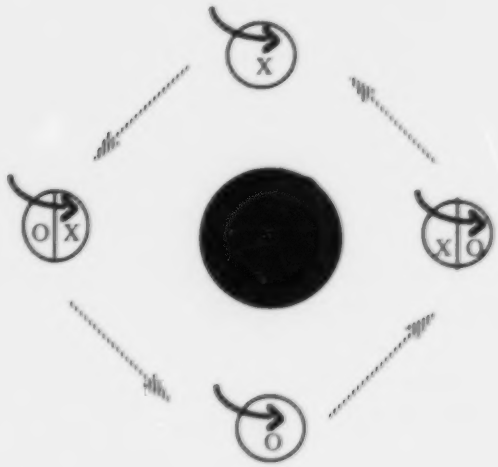


B4

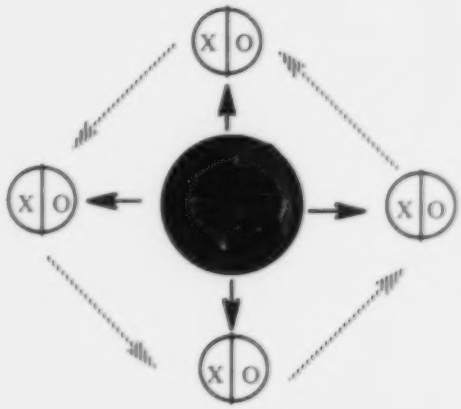
Earth's Satellite

The moon, Earth's satellite, circles around our planet as we make our yearly orbit around the sun. In stellar distances the moon and Earth are very near to each other, only a quarter of a million miles away. Every 29 and 1/2 days, the moon makes a complete circuit around the Earth. As it travels, the moon rotates on its own axis, just as the Earth does. Because of the synchronization of the moon's axial rotation and orbital movement around Earth, we are able to view only one side of the moon at all times (side X). If the moon had no axial rotation, we would see various portions of it throughout the month.

If you watch the moon throughout the night, it will seem to travel across the sky, moving from west to east. This apparent movement is caused partially by the moon's orbit around Earth, however the major cause is Earth's own axial spin. Every twenty-four hours, as we rotate from night into day, the view of the moon is left behind. The combination of Earth's axial spin, the moon's axial spin and orbit allow the moon to be viewed at night for two weeks. In the following two weeks, however, the moon rises during the day, when sunlight will usually outshine the moon's pale reflection. During these weeks you can sometimes glimpse a light image of the moon during the day.



With axial spin
Curved arrows show axial spin direction. straight arrows show direction of orbital movement.



Without axial spin. Short arrows point to portions viewed from earth, longer arrows show orbital direction.

B5

METEOR SHOWER

Focus To observe a meteor shower and the rate at which the meteors are falling.

Group Size Entire class

Time Required 20 minutes

Materials ***Shooting Stars***

Physical Setting Field in front of the campfire pavilion

Process

Introduction:
Start with a basic lesson on meteors and meteor showers. Below are the approximate dates of some of the larger meteor showers:

Shower	Approximate Dates	Rate Per Hour
Quadrantids	January 3	40
Lyrids	April 22	15
Perseids	August 12	50
Orionids	October 21	25
Taurids	November 4	15
Leonids	November 16	15
Geminids	December 13	50

Activity:
1. Bring class to a large, open field with no bright lights nearby.

2. Now they need to adjust their eyesight to the dark. Have them close their eyes and together, slowly count to 100.

3. Upon reaching 100, they may open their eyes and for the next six minutes keep track of how many "shooting stars" they see.

4. At the end of the six minutes, have everyone add a zero to the number of meteors they counted. This is the rate of meteors per hour.

Shooting Stars

Falling stars can be seen on any clear, dark night of the year. They are not actually stars, but pieces of cosmic rock or dirt (meteors) that have fallen through our atmosphere. The speed at which these meteors travel is faster than that of a bullet shot from a gun. The friction produced, when they crash through our atmosphere at these tremendously high speeds, causes the meteors to burn up and produce a star-like light. Most of these falling pieces are smaller than the size of a pea, and disintegrate before reaching the Earth. Only rarely is a meteor large enough to pass through the atmosphere without completely combusting. These huge chunks of rock will then crash into the Earth's surface, blasting out a crater.

At certain times during the year you can see many more meteors per hour than on other nights; these periods are called meteor showers. These meteor swarms occur when the Earth, in its orbit around the sun, passes through the remains of a comet. If the Earth is moving through these particles during daylight hours the meteor shower will not be visible to the naked eye. Certain meteor showers take place at approximately the same times every year. Each of these showers tend to come from the direction of a certain constellation, and so derives its name from that constellation.

NIGHT SIGHTS

Focus To teach constellation identification.

Group Size Entire class

Time Required 1 hour

Materials
Compass
Constellation wheels (*available at Cispus*)
Handouts:
What Stars Are
Shortcut To The Stars
Constellations Wheel
(instructions and information)

Physical Setting
Outside the Star Room (*constellation wheel*)
Large field near the Pavilion

Process

Introduction:
Begin with a basic lesson on stars and constellations. For introductory information about stars and constellations, consult ***What Stars Are***.

Activity:
1. Outside of the Star Room, give every student a constellations wheel. Demonstrate on the poster wheel how their individual wheels work, and what they might expect to see. Check with the ***Constellations Wheel (instructions and information sheet)***.

2. Using Shortcut to the Stars, provide hints to finding various constellations.

3. Next, take the class to the large field and have them seat themselves facing north. Adjust the constellation wheels to the correct position.

4. To adjust your eyes to the dark, have everyone close their eyes and slowly count together to one hundred.

5. Once your eyes are adjusted, look up at the sky and use your constellation wheels to locate as many constellations as you can.

6. Follow-up by relocating constellations together, and confirming proper sightings.

What Stars Are

Stars are shining bodies in space that are made up of extremely hot gases. The nearest star to the Earth is our sun. Stars are in a constant process of cooling; the process takes an extremely long time, billions of years. Our own sun is slowly cooling, something we will never notice in our lifetimes. Even when our great, great, great grandchildren are grown-ups, the sun will not have cooled enough for people on the Earth to notice. Over time, stars undergo changes of color and brightness. The hottest stars are bluish white. As they cool, the stars become white, then yellow, and finally a dark red for the coldest stars (sometimes called red dwarfs).

The sun is 93 million miles away from the Earth, yet it only takes 8 and 1/2 minutes for its light to reach us. The light from other stars, that are much farther away, takes a longer amount of time to reach us. When we look into the sky at night, we may be seeing the light from a star that no longer exists. We could be seeing the light from stars today which stopped giving light in the year 1000 A.D.

Thousands of years ago, the Egyptians began to make records of the movements of stars. They came to the realization that the stars change as the seasons did, and invented calendars based on the changing skies. Gravitation causes some stars to travel together. Some travel in pairs, rotating about their common center of gravity. Other stars travel in groups of three, four or more. The ancient Greeks observed these groupings. Their ancient astronomers and storytellers looked at the night skies and saw pictures in the groupings of the stars, and named them after mythological beasts and heroes. Thus, giving name to the constellations that people look at even today.

Constellations Wheel

instructions and information

To begin using the constellations wheel, face north. Then, hold the wheel in front of you, with the present month on top. This position shows how the constellations will look at 9.00 p.m. tonight. To make adjustments for viewing at different hours, turn the chart one month clockwise for every two hours before 9:00 p.m., or one month counter-clockwise for every two hours after 9:00.

As you rotate the wheel, you may notice that the North Star will stay stationary in the sky, while all of the other stars will seem to circle around the North Star. Although the stars of pole-circling constellations (Big Dipper, Little Dipper, Draco, Cepheus, Cassiopeia) are always in view during the night, the other constellations are only visible at certain times. Some of the constellations are not far from the North Star, and most months of the year these appear some time during the night. Other constellations are much farther from the North Star and are visible only during certain seasons.

Remember, it is best to star-gaze on a clear, moonless night. You will also see more stars if observation is conducted far from bright lights, or from hazy or smoggy air.

Shortcut to the Stars

The first constellation to look for in the night sky is the Big Dipper. It is a bright group of stars that resemble exactly what the name implies: a big dipper. It's visible all night long from most places in the Northern Hemisphere.

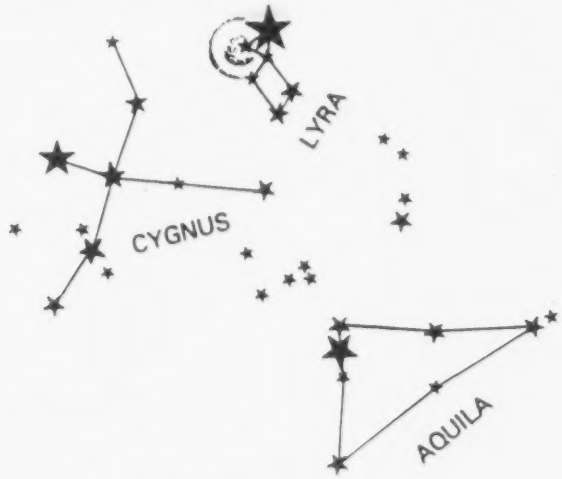
To find the Little Dipper draw a line, starting between the two end stars in the bowl of the Big Dipper and ending at the North Star. The North Star is not the brightest star in the sky, but it remains still while the others seem to revolve around it during the course of the night. The North Star makes up the outermost star in the handle of the Little Dipper.

Cassiopeia can be found by drawing a line from the handle star nearest the bowl of the Big Dipper, to The North Star, and then an equal distance beyond. The line will reach a group of stars that look like an "M" or "W". This is the constellation Cassiopeia.

In between the Big and Little Dippers are a few bright stars. These form the tail of the constellation Draco. If you followe the tail around the bowl of the Little Dipper, you can find the head of Draco. It's formed by a cluster of four stars.

Bootes is found by following the curve of the handle in the Big Dipper to the bright star at the tail of Bootes' kite-shaped constellation.

Three bright stars, most prominent in the summer months, make up the Summer Triangle. From this triangle Cygnus, Lyra and Aquila may be located. Each of these constellations contains one of the three stars of the Summer Triangle.



WAY UP NORTH

Focus To learn the nightly movements of Polar Constellations, with historical and mythological trivia about Polaris, the North Star.

Group Size 20-25 students

Time Required 1 hour

Materials
Nightly and seasonal star chart
3 Traffic cones or other markers
Flagging ribbon

Physical Setting
Preparation: large classroom or soccer field
Viewing: Star Room or night sky

Process

Activity 1: STARRING ROLES

Role play star movement:

1. Use the Chart to show students the positions of the two dippers, Casseopia, Cepheus, and Draco at 9:00p.m.
2. Mark the " position" of Polaris on the floor or field with a cone.
3. Select students to be constellations:
   5-Cassiopea; 6-Little Dipper; 7-Big Dipper; 5-Cepheus
4. Give each group a long piece of flagging ribbon to represent the lines connecting the stars on the chart.
5. Mark the "position" of the pointers with two cones. Have the constellations take their places and lay their ribbon on the floor.
6. Regroup, rotate the star chart to show the sky at midnight, pass out new pieces of flagging tape; repeat.
7. Rotate the chart to 3:00 a.m.

Activity 2: TALKING STARS

1. Discuss the evidence--what happens to the stars during the day? What does it mean to steer by the stars? etc.
2. Discuss the origins of the names for Polaris: Starship, Steering Star, Lodestar; Stella Maris, Mongolia: The Golden Peg, India: The Pivot of the Planets, China: Emperor of the Heavens (Earthly emperors were the "Sons of Heaven".)

Activity 3: SEEING STARS

Identify the Polar constellations in the night sky/Star Room.

WRITTEN IN THE STARS

Focus To acquaint students with the five polar constellations and their legends

Group Size Entire class

Time Required One session, about 1 hour
Two sessions of 15-30 minutes (*with independent writing time provided after session one*)

Materials
Paper
Pencil
Cassette player
Tape of Native American star legends
Legends about the polar constellations
Available in the Cispus office and science room
pointer-flashlight
constellation chart
Handout: ***Stargazing Chart***

Physical Setting Indoor or Outdoor classroom with tables
Star Room

Process

Activity 1: FINDING THE PATTERN, TELLING THE STORY

1. In the Star Room: Turn on the ultra-violet lights and adjust so that only the brightest, (first magnitude) stars and major constellations are visible.
With the pointer-flashlight locate Polaris (the North Star) and the rest of the Little Dipper- Ursa Minor, the Little Bear. Then locate the Big Dipper-Ursa Major- the Big Bear.
2. Read or tell two or three legends about these constellations from Greek, Roman, Norse, and/or Native American mythology.Using the pointer stars on Ursa Major and the flashlight return to Polaris, home base for the lesson.
3. Find Casseopia , share the legends, return to Polaris. Repeat for Cephus and Draco.

Options:
Have each student mark Polaris
Have students create a constellation ont heir charts, then write a legend about it.

Activity 2: CREATING NEW PATTERNS AND STORIES

1. Return to classroom setting.
Distribute ***Stargazing Chart*** to students. Show them a star chart with the constellations depicted.

Activity 3: SHARING OUR IDEAS

1. In the Star Room meet in small groups for sharing of individual constellations and stories, and/or provide for large group sharing.
Collect student papers etc. before next activity.

ACTIVITY 4: Looking and Listening
"The Big Event" of the lesson
Turn down the lights (to simulate sunset), then completely off so that all the stars and the Milky Way suddenly appear. As the ahs subside start the tape. Enjoy!

Resource List

Her Seven Brothers by Paul Goble, Bradbury Press, New York, 1988- A beautifully illustrated retelling of the Cheyenne legend about the creation of the Big Dipper

Quillworker, a Cheyenne Legend by Terri Cohlene, Watermill Press, Mahwah, N.J- A slight variation of the preceding legend which includes a timeline and glossary.

Indian Tales by Joseph and Edith Raskin, Random House, 1969- includes "How the bear lost his tail".

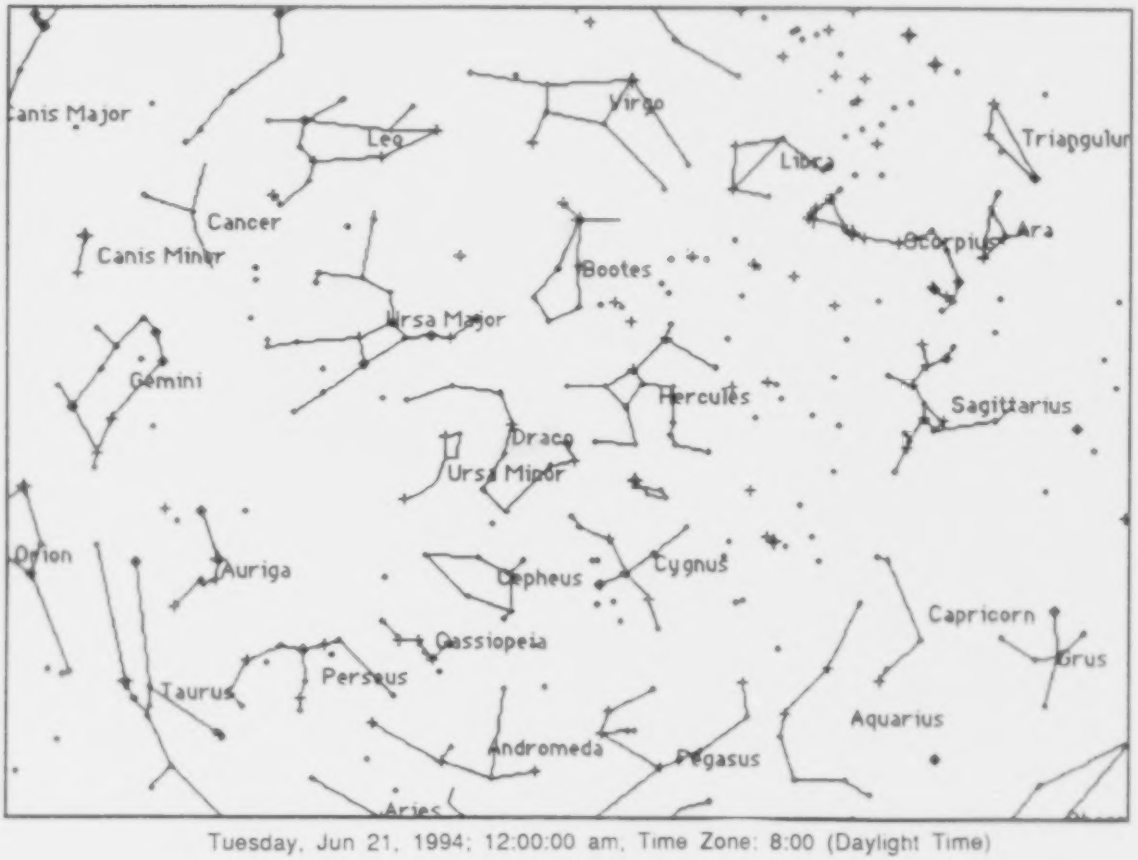
Star Tales by Gretchen Will May, 1987- North American Indian stories about the stars.

The Heavenly Zoo by Alison Laurie- legends and tales of the stars

Look into the Night Sky by Seymour Simon, Viking Press,1977

Stargazing Guide compiled by Lee La Due, Cispus Press,1988

Constellation Chart

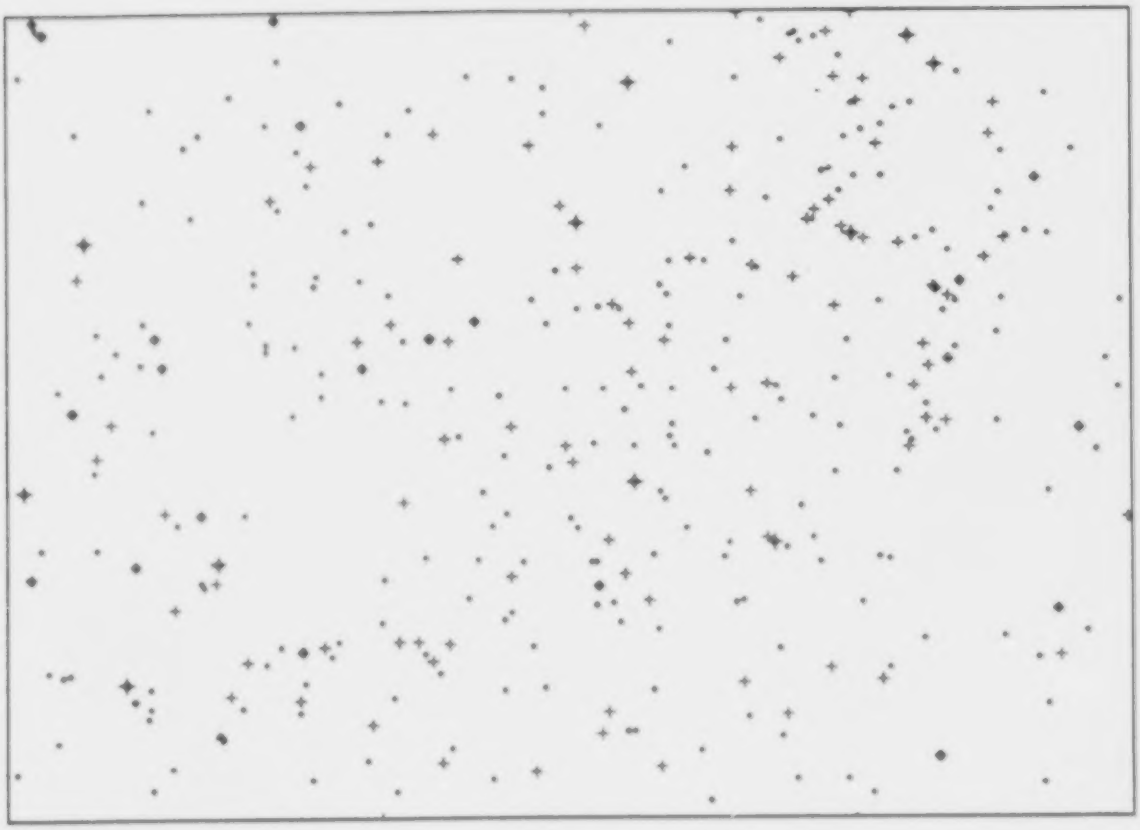


Tuesday, Jun 21, 1994; 12:00:00 am, Time Zone: 8:00 (Daylight Time)

B13

BEST COPY AVAILABLE

Stargazing Chart



Tuesday, Jun 21, 1994; 12:00:00 am; Time Zone: 8:00 (Daylight Time)

B14

Wear-It-Away

CHEWY CONGLOMERATE

Focus

To create an edible "rock" in this hands-on activity. Should follow an activity involving the observation and identification of rocks. Rock conglomerates are sedimentary rocks made up of a wide range of grain sizes, like pebbles cemented in a finer sandlike material.

Group Size

Entire group

Time Required

30 minutes

Materials

One part peanut butter
One part nonfat dry milk
One tablespoon honey per cup of peanut butter (*this is the "cement"*)
12" piece waxed paper per student
Zip-lock baggies for finished products

The following suggested condiments are the coarse part of the"rock":

raisins
chopped nuts
m & m's
granola
dried fruit bits

Allow approximately 1/4 cup peanut butter and nonfat dry milk per student. Amount and types of condiments will depend on the teacher. A 1/4 cup of mixture will give each student a "rock" about 2 inches in diameter.

Physical Setting

A Cispus classroom with easily accessible hot, running water

Process

1. The peanut butter, nonfat dry milk and honey mixture should be prepared by an adult. Amount of each ingredient used will depend on the number of students in the group. The large mixer in the Cispus kitchen works great for mixing. It could be prepared before arriving at Camp.
2. Set up a clean table with condiments in containers placed down the middle of the table.
3. Each student is given a 12 inch piece of waxed paper to work on.
4. An adult or counselor puts 1/4 cup of the conglomerate mixture onto the student's waxed paper and student then adds the condiments he/she desires in his "rock."
5. Student may eat it immediately or place in a zip-lock baggie with his/her name on it.

CHIP OFF THE OLD ROCK

Focus To explore the affects of weathering on rock using observation, prediction, measurement and experimentation skills.

Group Size Entire class, divided into small groups.

Time Required 30 minutes

Materials

Glue or a hot glue gun
Box of sugar
Water-misting bottles
Pie pans
Balance
White drawing paper

Physical Setting Cispus classroom

Process

1. Assign students to work in groups of two or three. Tell half the groups that they will be Tumblers and the other groups that they will be Misters. Give each small group ten sugar cubes. Put some cubes aside for comparison at the end of the investigation.

2. Each group should create a rock formation out of the sugar. Have each student glue their rock formations into a solid form using glue or the hot glue gun. Caution students that a little glue goes a long way. Let them dry overnight. If you've used regular glue, the formations may take longer to dry.

3. Have each group draw a picture of their rock formation. Weigh it, and record the weight.

4. Explain that the Misters will place their rock formations in a pie pan in preparation for spraying them with water. Then the Tumblers will place their rock formations in empty yogurt or margarine containers and seal them.

5. Have each group form a hypothesis about what they think will happen to their rock formations (i.e. "If we shake our rock formation for two minutes, it will change shape.").

6. When you give the signal to begin, the Misters will spray their rock formations with water and shake them around in the pie pan for two minutes. The Tumblers will shake their sealed containers vigorously for two minutes.

7. After the experiment, have each group weigh their rock formations again. Have the Misters and the Tumblers display their rock formations alongside the rock (sugar cubes) that you have set aside. What rock comparisons can they make between the rocks? How do the results compare with the hypothesis? How can you compare these results to the effects of weathering on rocks?

CLEARING THE MUDDY WATERS

Focus To develop the concept of sedimentation as a flip side to erosion.

Group Size Entire class

Time Required Initial 5 minutes
Follow up 5-15 minutes later during the same day, or next day

Materials

Pebbles	Clay
Fine sand	Silt
Coarse sand	Clear glass jar with a screw top

Physical Setting Classroom before or during Cispus

Process

1. Fill the jar 1/2 full of water. Finish filling the jar with about equal parts pebbles, coarse sand, fine sand, clay, and silt (or any combination that is available). Shake the jar and then allow to sit undisturbed.

2. Discuss how water erodes a mixture of dirt, sand, and rocks. Discus what students think will settle out first and why.

3. Wait an hour or more and compare student predictions with actual results. Students could draw the layers, with measured thickness and appearance (color, texture). This serves best as a lead in for field observations.

CRACK, CRUMBLE AND CARRY

Focus To define weathering, erosion, and deposition. To demonstrate the effects of erosion or weathering on the earth, and to find evidence of these forces in the Cispus environment.

Group Size Entire class

Time Required
1.5 hours total
1 hour class time
1/2 hour for Wear-It-Away-Walk

Materials
Laminated cards for each experiment
Materials listed on each experiment card
Clip board and paper/pencil

Physical Setting Classroom setting and a forest trail

Process

1. By conducting a variety of simple demonstrations, your group can discover more about how the forces of weather, erosion, and deposition are constantly shaping the surface of the Earth. Afterward, they can take a "Wear-It-Away-Walk" on a nearby trail to find examples of these processes at work in the forest or their home community.

2. Before you begin the class, have each of the demonstration activities glued on a card and the expected results and explanation glued to the back. Laminate each card.

3. Discuss the processes of weathering, erosion, and deposition (see attached resource page).

4. After your discussion, divide the group into teams of four or five children and give each team one of the demonstration cards. Explain that each person on each team must conduct the demonstration on the card and record the results. Tell the students that they should share materials.

5. Then explain that the members of each team should pool their information and put together a team presentation for the rest of the group. Tell the students that each team's presentation should include the following:

   A. An explanation of what they did, including a list of materials they used, how they set up the demonstrations, what controls they used, and so on.

B. A discussion of the results of their demonstrations and what conclusions they drew from their results. They should also explain how their demonstration relates to weathering, erosion, or deposition.

C. An explanation of why some of the data that each person gathered differed (if it did), even though each person did the same demonstration.

D. A description of another way to demonstrate the same concept.

6. Explain that each group can show the actual materials from the demonstration, conduct the demonstration in front of the group if it's a quick one, make charts or graphs to record their data, or use a flip chart to explain what happened. Also, encourage each person in each team to take part in the team's presentation. Encourage other students to ask questions or challenge with ideas for further investigations.

7. You should also mention that these are indoor demonstrations that simulate some of the processes of weather, erosion, and deposition, and they are not exactly what happens outside. For example, explain that some of the materials used in the demonstrations, such as vinegar, lemon juice, and hydrogen peroxide, aren't the actual substances that would cause rocks to weather. But these chemicals act in a similar way to those that do shape the landscape.

8. After all the presentations have been made, take the "Wear-It-Away-Walk" with clipboards for students to record their "finds".

NOTE: Some of these activities require more time than others. Allow several days for all the demonstrations to be completed before having teams share their results and conclusions.

#1 PLASTER AND ICE

WHAT YOU NEED:
Plaster of Paris, water, a small balloon, two empty pint milk cartons (bottom halves only), a freezer

WHAT TO DO:
1. Fill balloon with water until it is about the size of a Ping-Pong ball. Tie a knot in the open end.
2. Mix water with Plaster of Paris until the mixture is as thick as yogurt. Pour half of the plaster into one milk carton and the other half into the remaining carton
3. Push the balloon down into one of the plaster filled cartons until it is about 1/4 inch under the surface. Hold the balloon there until the plaster sets enough so that the balloon doesn't rise to the surface. Let the plaster harden for about 1 hour.
4. Put both milk cartons in the freezer overnight. Remove containers the next day to see what happened.

WHAT HAPPENED:
What happened to the plaster that contained the balloon?
What happened to the plaster without a balloon?
Why was there a difference?
Which carton acted as the control? Why?
How does this experiment illustrate what happens when water seeps into a crack in a rock and freezes?

#2 A SOUR TRICK

WHAT YOU NEED:
lemon juice, vinegar, medicine droppers, and two pieces each of limestone, calcite, chalk, and quartz.

WHAT TO DO:
1. Put a few drops of lemon juice on one piece of each rock sample.
2. Put a few drops of vinegar on the remaining four rocks.
3. Look and listen carefully each time you add vinegar or lemon juice to the samples.

WHAT HAPPENS:
What happens when you put lemon juice on each rock?
What happens when you put vinegar on each rock?
Did the lemon juice and vinegar act the same way on each rock?
Why did some of the rocks react differently?
What does this experiment have to do with weathering?

#3 STEEL WOOL AND WATER

WHAT YOU NEED:
3 shallow dishes, 3 pieces of steel wool, salt, water.

WHAT TO DO:
1. Place each piece of steel wool in a separate shallow dish.
2. Pour equal amounts of water over 2 of the pieces of steel wool and leave the third piece dry.
3. Sprinkle one of the wet pieces with a thick layer of salt.
4. Observe and compare the 3 pieces every day for a week.

WHAT HAPPENED:
What happened to each piece of steel wool?
Which piece changed the most?
Which piece of steel wool acted as the control?
What does this experiment have to do with weathering?

#4 A PENNY FOR YOUR THOUGHTS

WHAT YOU NEED:
4 new pennies, 4 shallow dishes, salt, vinegar, hydrogen peroxide, hand lens, masking tape, pen, measuring spoon.

WHAT TO DO:
1. put each penny in a shallow dish, head side up.
2. Cover one penny with 3 teaspoons of salt
3. Cover the second penny with 3 teaspoons of salt and 3 teaspoons of vinegar.
4. Cover the third penny with 3 teaspoons of salt and 3 teaspoons of hydrogen peroxide.
5. Leave the fourth penny uncovered.
6. Label the dishes according to the ingredients added.
7. Let the pennies stand for 2-3 days. Then, remove and clean them off. Use a hand lens to study the pennies and compare the effects of the various substances.

WHAT HAPPENED:
How did the pennies in each dish change?
Did some of the pennies change more than others?
What do you think would happen if you left the pennies for another week?
Which penny acted as the control? Why?
Pennies are made of copper and zinc--two elements found in many types of rocks. How does this information and the results of the experiment relate to weathering?

#5 SHAKE IT UP

WHAT YOU NEED:
15 rough stones of fairly uniform size, 3 lidded containers (coffee cans), 3 clear cups or jars, pen, paper, masking tape

WHAT TO DO:
1. Separate the stones into 3 piles of 5. Put each pile on a sheet of paper.
2. Label the piles A, B, and C. Label each can and jar in the same manner.
3. Fill all the cans halfway with water. Place each pile of stones into the matching can (pile A into can A, etc.). Let the stones stand in the water overnight.
4. The next day, hold can A in both hands and shake it briskly, 100 times.
5. Remove the stones from can A and pour the water into jar A.
6. Repeat the process with can B, shaking the can 1000 times instead. Switch shakers or rest if necessary.
7. Do not shake can C. Remove the stones and pour the water into jar C.
8. Compare the 3 piles of stones and the 3 jars of water

WHAT HAPPENED:
How do the piles of stones differ? Can you explain why?
Which pile acted as the control? Why?
How do the jars of water differ?
How does this experiment compare to the action of stones in a fast-moving stream?

#6 ICE ON THE MOVE

WHAT YOU NEED:
sand, several flat pieces of shale or limestone, ice cubes, 2 paper towels, ice cube tray, a freezer

WHAT TO DO:
1. Mix several teaspoons of sand with water and pour the mixture into ice cube trays and freeze.
2. Use a paper towel to pick up one of the sandy ice cubes.
3. Hold the ice tightly against a piece of shale or limestone and slowly push it across the rock several times.
4. Examine the surface of the rock.
5. Do the same thing with a regular ice cube on another piece of rock.

WHAT HAPPENED:
Compare the rock surfaces. What are their similarities and differences?
How does this experiment explain the way glaciers help shape the land?

#7 THE LAYERED JAR

WHAT YOU NEED:
large jar with a lid, water, pebbles or gravel, coarse sand, soil.

WHAT TO DO:
1. Put a layer of pebbles, sand and soil in the jar.
2. Fill the jar with water and cover.
3. Shake the jar until everything in the water is jostled about.
4. Set the jar down and watch what happens in 10-15 minute intervals for about an hour. Then check it several hours later.

WHAT HAPPENED:
How did the water look after you shook the jar?
Which material settled to the bottom first? Why?
Which material settled last? Why?
Based on this experiment, when a fast-flowing river carrying pebbles, sand and soil begins to slow down, what will settle out first?
What will be carried farthest downstream?

A WEAR-IT-AWAY-WALK

After the class has a better understanding of how the Earth's wearing-down and building-up forces work, go on a hike to look for signs of weathering, erosion, and deposition in the area. Find and record on white art-paper the following examples of weathering:

1. Find signs of erosion caused by water on bare hillsides and slopes. Also look on the banks of rivers or streams and sites where erosion showing trees and grass have been removed.

2. Look for places where trees and other plants are growing out of rocks, such as a crack in a sidewalk. Look for bits of soil in the cracks.

3. Look for lichens on rocks. Lichens can start to grow in rock crevices, and as they grow they produce a mild acid which can help break rocks down.

4. Look for smooth rocks in stream beds and on beaches.

5. Look for loose rock and soil at the bases of slopes.

6. On a rainy day, check for soil washing away under storm drains and down gutters.

09

WHAT YOU SHOULD EXPECT:

1. PLASTER AND ICE: The plaster containing the balloon should have cracked as the water in the balloon froze and expanded. When water seeps into cracks in the rocks and freezes, it eventually breaks rocks apart.

2. A SOUR TRICK: The Lemon juice and vinegar both contain weak acids. The lemon juice contains citric acid and the vinegar contains acetic acid. These mild acids can dissolve rocks that contain calcium carbonate. The lemon juice and vinegar should have bubbled or fizzed on the limestone, calcite, and chalk, which all contain calcium carbonate. There should not have been a reaction on the quartz, which does not contain calcium carbonate. Water often contains weak acids that dissolve rocks containing calcium carbonate and other minerals.

3. STEEL WOOL AND WATER: When iron gets wet, the water acts as an agent to speed up oxidation. (Oxidation occurs when oxygen combines with another substance). In this case, oxygen in the water combined with the iron in the steel wool to form iron oxide, or rust. Rust is a weaker material than the original metal and it erodes quickly. When salt is added to the water, wool in salt water will be the one that changes most.

4. A PENNY FOR YOUR THOUGHTS: If the pennies are left long enough, the pennies with salt, salt and vinegar, vinegar, and hydrogen peroxide should all change. Salt will react chemically with the copper to produce copper chloride. Vinegar and salt will slowly dissolve the copper, forming green copper salts. And the hydrogen peroxide will speed up the reaction.

5. SHAKE IT UP: The longer the stones were shaken, the more rounded their edges should be. Jars **A** and **B** should have some sediment in the bottom, but **JAR B** should have more since more shakes would have broken off more bits of rock. The same thing happens to rocks that are carried along in rivers or are churned about by the surf.

6. ICE ON THE MOVE: The ice cube with sand acts like sandpaper, and should leave scratches on the rock surfaces. The control should not show scratches. When glaciers move across land, they pick up and move rock material. Some of this rock material can scratch and gouge rock surfaces.

7. THE LAYERED JAR: When the jar is first shaken, the water appears cloudy. As the particles settle, the water becomes clearer. First the heaviest material - the pebbles or gravel - settles to the bottom. Then the sand settles out. And finally the lightest material - the clay and silt in the soil - settles on top. When a river slows down, the same thing happens, with the heavy boulders and rocks dropping out first and the fine silt and clay being dumped last. This is why a fertile delta often forms at the mouth of a river.

DOWN & DIRTY:
Soil Profile

Focus To use field study and sensory observations to understand that soil is not homogeneous but a composite made up of layers, which are deposited and modified through an understandable process.

Group Size Entire class, working in teams of 4

Time Required 1.5 hours

Materials

Soil pH kit	Yard stick
Soil thermometer	Magnifying glasses

Handout: ***Dusty Deeds***

Physical Setting Cut bank near a stream *(Covell, Angel Falls trail, Cispus River)* or a road cut.

Process

1. Students look around at the material on top of the ground. They need to note if the soil is flat or sloped, what is present on top of the ground. Look for soil removal due to erosion.

2. Find an area along a stream or river, where the soil has been cut into by erosion. Road cuts often expose the layers of soil. Soil pits are available across the road from Cispus Center.

3. Using an area where the layers of the soil are exposed, have students look for the color of the different layers of soil: How do they smell? What is the texture? Is there any sign of animal or plant life, living or dead? Is the soil wet or dry? Is the soil cold or warm? Look closely at the soil with a magnifying glass.

Draw the layers of soil in the left column of the Soil Profile Task sheet . Use a meter stick to measure the thickness in centimeters, a pH kit to determine the relative acidity or alkalinity of the soil. Use a soil thermometer to measure the temperature of each layer.

Record results on the Soil Profile Task sheet, central column.

Explain why the soil has the color, odor, pH, temperature, etc. that you found in each of the layers.

Share your results with other groups.

DUSTY DEEDS

Name_____

Teacher_____

Using the observations and measurements of the layers of soil, draw the layers in the DRAW column, record your observations and measurements in the DATA column and record your ideas about why the different layers have a different appearance, pH, depth, etc. in the INTERPRETATIONS column.

DRAW	DATA	INTERPRETATIONS
	Contents of **Duff**_____	_____
	Depth _____" to _____	_____
	A Horizon: **Topsoil** Depth _____"to _____"	_____
	Color_____	_____
	Texture: Sandy_____Silt_____Clay_____	_____
	Structure: Columns_____Blocky_____	_____
	Plates_____Granules_____	_____
	pH_____Temp. _____°F Plant Roots____	_____
	B. Horizon: **Subsoil**: Depth_____" to____"	_____
	Color_____	_____
	Texture: Sandy_____Silt_____Clay_____	_____
	Structure: Columns_____Blocky_____	_____
	Plates_____Granules_____	_____
	pH_____Temp. _____°F Plant Roots____	_____
	C. Horizon: **2nd Subsoil** Depth____" to ____"	_____
	Color_____	_____
	Texture: Sandy_____Silt_____Clay_____	_____
	Structure: Columns_____Blocky_____	_____
	Plates_____Granules_____	_____
	pH Temp °F Plant Roots	_____

O12

NOWHERE TO RUN

Focus To help students understand how rain, melting snow or runoff from buildings can cause soil erosion, and how plants can prevent this. Students will also learn how soil compaction causes flooding, puddling, run-off, and erosion. They will learn about how surface water moves over and through soil.

Group Size Small groups of 3-4 can be supervised in one area
Entire class is possible

Time Required 30-45 minutes

Materials One plastic water pitcher for each group of 3
Ready supply of water to refill pitchers
Plastic pipettes
Small digging implement, such as an old teaspoon
Pencils and hard surface for writing on.
Handout: ***Run, Water, Run!***

Physical Setting Various locations around the Cispus area

Process

1. Discuss with students what happens to rain after it falls. Where does it go? Why does some rain or snowmelt move through the soil while other times it will puddle up or run off? How does soil become compacted around Camp Cispus? What is the effect of the runoff from the buildings, downspouts, etc.? Are there areas in Camp where large amounts of rain or runoff can be absorbed? What allows this?

2. Divide students into groups of three. Distribute water pitchers, pipettes, spoons, question and observation sheets with hard surface (cardboard pieces?) for writing on, and pencils. Allow groups to move around Camp looking for evidence of rain and runoff movement and its effects on the soil, especially in areas of soil compaction. Students should try sprinkling water (not just dumping large amounts!) slowly on different areas and observing whether or not it soaks in or runs off or both. They should try exposed soil and soil where grass or other plants are growing, sloping areas, flat and sloping trails, compacted and non-compacted areas. They can also dig very small holes in different areas with spoons, adding water, and observing effects.

3. Gather groups together and discuss findings and implications. Do further testing and observations.

NOWHERE TO RUN

QUESTIONS AND OBSERVATIONS

1. WHERE IN CAMP CISPUS DO YOU SEE EVIDENCE OF WATER RUNOFF? WHAT SEEMS TO CAUSE THIS?

2. WHERE DOES THE RAIN AND RUNOFF GO IN CAMP CISPUS? WHAT NEGATIVE EFFECTS MIGHT RUNOFF HAVE ON THE ENVIRONMENT?

3. BY POURING OR DRIPPING WATER FROM PITCHERS AND WITH PIPETTES, WHAT CAN YOU DISCOVER ABOUT THE SOIL AROUND CAMP AND HOW IT IS AFFECTED BY COMPACTION, RAIN, AND RUNOFF? (IF IT'S RAINING, YOU MAY NOT NEED TO ADD MORE WATER!)

4. HOW COULD THINGS BE CHANGED/IMPROVED AT CAMP CISPUS TO PREVENT SOIL COMPACTION AND ITS NEGATIVE EFFECTS? PERHAPS YOU COULD MAKE SUGGESTIONS TO THE CISPUS MANAGEMENT!

READING THE LANDSCAPE

Focus To gain a basic introduction to glaciers by examining the natural features of the Cispus Valley

Group Size Entire class

Time Required 1 hour

Materials
Notebook
Pen
Topographic map
Textbooks picturing glaciers *(see source list)*
Handout/Reading: ***Imagine the Past***

Physical Setting
Confluence of Cispus River and Yellowjacket Creek
Cispus library

Process

Activity 1: DISCUSSION INVESTIGATION

1. Have students discuss what they think a glacier looks like; how do they think one forms? Possible topics include: River of ice, compression, plucking rocks, scouring, retreating, advancing.

2. Continue by asking "What clues in the landscape indicate this valley was scooped out by a glacier?" Possible discussion of U-shaped valley, glacial flour, flat face of tower rock.

3. Improvise an imaginary re-enactment of the Mt Adams glacier advancing and reshaping the Cispus valley (see **Imagine the Past** page for ideas/reading). Ask the students to close their eyes for this activity. In your story try to incorporate the students' ideas and answers about glaciers.

Activity 2: FOLLOW UP

Hike back to the center's library. Using a topographic map of the Cispus region and geology texts (see list), look at pictures of glaciers. End with having the children draw the glacier shaping the Cispus Valley.

IMAGINE THE PAST

Listen to the wind and the water. Imagine it beginning to snow and snow and snow. Imagine sitting here for seven years, for 70 years! All the while snow accumulates, layer upon layer, freezing solid. Imagine the snow spilling down out of the mountain, off the hills into this river- because of gravity, because this is the lowest place in the valley. The river fills up with snow, compacting into dense unchippable ice--like a giant ice snake slinking up the valley, gripping rock chunks, freezing boulders to its belly, rubbing and grinding against both sides of the valley. This glacier is 500 feet thick, taller than the trees.

Now imagine the snow stops, the cold dissipates. The sun comes out and everything starts to soften and drip. The glacier starts to melt where it's thinnest, at the tail, ice turns into water that runs down the river...free. Stones and rocks once clenched and frozen, packed under massive ice, have crumbled to dust and sand. Others are fractured and shorn. The sun keeps shining . It's warm and balmy. Little by little the tough, stubborn ice melts, dripping away. Every year the glacier shrinks a little bit, revealing scuffed valley walls, the clean, shorn face of Tower Rock, melting away until it's no longer a valley-long snake but a slug or a worm existing in the coldest iciest place in a cleft of Mt. Adams, where it began.

RESOURCES

Available in the Cispus Library

A Field Manual for the Amateur Geologist. Alan Cvancara

Essentials of Earth History. W. Lee Stokes (pg 428)

The Earth, An Introduction to Physical Geology. Tarbuck and Lutgens (chp. 11, pg 257)

Physical Geology. Edgar Spenser (chp. 24, 457-517)

THAR'S GOLD IN THEM HILLS

Focus To introduce students to recreational geology.

Group Size Entire class. 1-3 per pan

Time Required 30-60 minutes

Materials Gold pan *(Cispus Center has some gold pans, or use aluminum pie tins with fluted sides)*
Small glass or plastic jar with lid

Physical Setting Yellowjacket Creek

Process *The following instructions came with "The 49er GOLD PAN™" (818)768-3888, Sun Valley, CA 91352. The instructions have been paraphrased:*

1. Fill the gold pan one-quarter full of paydirt. Paydirt is sand and dirt from sand bar along Yellow Jacket Creek. Cover the paydirt with water. Now lightly hit the ridge of the pan 7 to 8 times to settle the gold to the bottom. With a dipping motion in the stream, wash off the excess rock and sand over the horizontal leaning riffles on the edge of the pan. Repeat the process until only a small amount of sand is left in the pan.

2. Next, position the pay dirt over the gold traps and hit the ridge of the pan, as before, to settle the gold to the bottom. Then turn pan in a circular, flat motion, allowing the gold and black sand to fall into the gold traps.

3. Find more nuggets and flakes of gold by using a 49er Gold Crevice Tool. The 49er Gold Crevice Tool is used to reach deep into the various cracks and crevices of the stream bed to remove the heavy paydirt. An oven baster (huge eye dropper) works instead of the Crevice Tool.

4. Transfer the remaining black sand and gold specks to a clear plastic or glass container with a screw top.

5. There are several ways to determine if the gold colored specks are gold or not. One way is to smash the speck between two flat knife blades it see if it crushes or flattens. If it flattens it is gold. This only works with larger particles.

6. Many jewelers and high school chemistry labs have or can make an acid solution called Aqua Regia. This is a mixture of concentrated nitric and sulfuric acid. Gold will not dissolve in any single acid. It will dissolve in this mixture. This is a hazardous mixture and you may want to ask a jeweler or high school chemistry instructor for help testing the gold.

WHAT DUG THIS?

Focus To discover what natural forces created, and are still changing the Cispus River Valley.

Group Size Entire class

Time Required 1-2 hours

Materials Geology of the Cispus Environmental Center Area (*available in the office*)
Drawing paper
Charcoal (*buy, or get it from the fire pit*)

Physical Setting Locate points where there are clear views of the Cispus River Valley downstream, Yellow Jacket Creek, Covell Creek, and Tower Rock.

Process Prior to coming to the environmental center, read the portions of the Geology of the Cispus Area that are appropriate to your students' ages. Pay particular attention to the development of U-shaped valley formation (glaciers) and V-shaped valley formations (water).

1. Go just downstream from the confluence of the Cispus River and Yellow Jacket Creek. Have the students look downstream and observe the shape of the valley in the distance. This is a good place to make charcoal drawings of the valley and Tower Rock. Doing charcoal drawings at each of the sites tends to enhance the children's perception of the valley shapes.

2. Have the students interpret how they believe the valley was formed and provide a rationale for their belief. Have them pay particular attention to the shape of Tower Rock.

3. Go to a point upstream from the confluence, where a good view is available of the Yellow Jacket Creek Canyon. Have students repeat steps 1 & 2.

4. Go to Covell Creek to look at a stream in the early stages of valley development.

Local Landmarks

FINDING YOUR WAY ON MT. ST. HELENS

Focus To introducing students to Mt. St. Helens Volcanic Monument's features through map study.

Group Size Entire class

Time Required 30-45 minutes

Materials Pencil
Mt. St. Helens National Volcanic Monument Rev. 4/1993 R6-GIP-RG063-90, available at Mt. St. Helens Natl. Volcanic Monument Visitor Center; 3029 Spirit Lake Highway; Castle Rock, WA 98611
Handout: ***Finding Your Way on Mt. St. Helens***

Physical Setting Classroom at school before visiting Mt. St. Helens Interpretive Center
or Cispus Classroom before going to Mt. St. Helens.

Process 1. Students use Mt. St. Helens and Vicinity and Mount St. Helens National Volcanic Monument maps to answer the questions on the attached question sheet. This can be an introduction to the location of various features on Mt. St. Helens prior to visiting the interpretive center, or a trip to Mt. St. Helens itself.

Finding Your Way On Mt. St. Helens

A Forest Service map of Mt. St. Helens can be used and these questions modified

Mt. St. Helens and Vicinity

1. In which national forest is the monument located?

2. How far is it from Iron Creek Picnic Area to Pine Creek Information Center to _____. Give your answer in miles. Use the scale.

3. Find the Crater of Mt. St. Helens. Does the map show the dome?

4. What is the name of the dark gray area in the center of the map?

5. What three services are available at the Mount St. Helens Visitor Center near Castle Rock ?

6. What does TTY stand for?

Mount St. Helens National Volcanic Monument

1. Spirit Lake is in which direction from the Mt. St. Helens Crater: northwest, north, or northeast?

2. What services are available at Lahar?

3. How far is it from Eagle Cliff Picnic Area to Clearwater?

4. What should you take with you to Clearwater?

5. If you wanted a drink of water, name the 4 places you could get one.

6. Name 3 places that you could go to take great pictures.

LAST INDIANS IN LAYSER CAVE

Focus To learn about the culture of local indians 3500 years ago by reading and listening to a dramatization based on actual discoveries. The period of the dramatization coincides with an eruption of Mt. St. Helens that occurred during the time the cave was abandoned.

Group Size Large or small groups

Time Required 50-60 minutes

Materials
Pen/pencil
Writing surface
Story: **"NO BERRIES--BIG SMOKE"**
Worksheet: ***Last Indians in Layser Cave***

Physical Setting Layser Cave (*ask for directions from Cispus staff*) or any classroom

Process

Activity 1: LAST INDIANS IN LAYSER CAVE
1. Get your students comfortably seated.
2. The story, TO BE READ ALOUD, may be stretched between several reading periods. It takes 22-25 minutes to complete the story start to finish.
3. After reading the story pass out the worksheet activity. Allow your students to work together cooperatively.

Extensions:
1. See other Layser Cave activities in the **"THE CISPUS EXPERIENCE, Curriculum Guide"**
2. Watch the film, **"Layser Cave Silent Voices, Vital Clues,"** (20 min.) available from the Cispus Center film library.
3. Show the film, **"This Place In Time,"** (24 min.) about the Mt. St. Helens eruption, and compare warning signs of how we coped with the rubble left from its fallout to how the band of indians in the story coped with their encounter with the "Mountain". The film is in the Cispus film library.

Last Indians In Layser Cave

1. For what purpose did the Native Americans in the story use the cave?

2. We named the cave after its discoverer, what name might they have given the cave?

3. Describe how work may have been divided up among band members.

4. How do you think the people in the story felt about their work?

5. In what specific ways did they show pride in their work?

6. Based on the description of their living quarters, draw a diagram of how you think the cave's living space was organized. Include sleeping spaces, space to process animal skins, tool making area, heating and cooking, food storage areas, water storage containers, and weapon storage. Show an outline, front of the cave, and back of the cave.

7. Who did you most identify with in the story? Why?

8. How do you suppose band members felt about each other? Give examples?

9. How were the Mountain's warning signs and eruption interpreted by Wise One?

10. Of what value were the meadows to the tribe? What activity was carried out there that was important to them?

11. How was it shown the Native Americans in the story had a balanced diet?

12. How was it shown they had a knowledge of medicine?

13. How do the eruption experiences of the characters in the story (warning signs, eruption, landscape changes), compare with what we actually experienced in the1980 eruptions of Mt. St. Helens?

14. How did they know what the warning signs meant?

15. Why do you suppose they never returned to their cave?

16. List the names and show the relationships of the band members in the story. How many lived in the cave during the summer the story takes place?

17. What evidence is there of apparent spiritual values?

18.. In what specific ways could it be said the Native Americans depicted in the story were civilized, based on the following criteria:
Civilization= specialized occupations, calendar, writing, some form of governing or authority, a system of numbers, religion, and trading relationships with other groups.

No Berries Big Smoke

A Story of the last Native Americans to use Layser Cave

by Mike Gullickson

Layser Cave was discovered in 1982 by Tim Layser, a Forest Service worker surveying the land for a timber sale. Entering the cave located on a steep south facing slope he was amazed at its size. Some 60 feet deep and 40 feet wide you could stand up in most areas. Turning back to face the opening, he glanced down to see the remnant of an ancient fire ring. To his left was a large stone, smooth on top. Nearby, partly buried was a stone tool used for cutting meat. It was wedged in the groove of a wood handle and bound with some kind of stringy fiber. Though not an archaeologist, Tim Layser recognized at once that this was an important discovery. He immediately left and filled out a form identifying the site and filed it with his supervisor.

Within a few years plans were made to excavate the site. After the cave had been vandalized by looters in 1985 it became imperative that the excavation begin right away. So in 1986, archaeologists from the Forest Service and Washington State University began a scientific excavation at the site.

Dated artifacts and carbon samples determined the last occupation was about 3500 to 4000 years ago, that prior to that the cave had been seasonally occupied for about 5000 years. The last use of the cave corresponded with a significant eruption of Mt. St. Helens.

What follows is a possible scenario of a band's last occupation there. The story itself is fictional, but the activities described and tools used are based on actual archeological discoveries made at Layser Cave.

The dawn's first light filtered through the cave's opening. Little dust fairies floated into and out of the dim glow of early morning light. Chirping birds began to rise as the day woke up; once in awhile one flew into the cave and then quickly out again. This had been their band's summer base camp for as long as anyone could remember.

A wisp of smoke floated lazily up from the ashes of last night's fire. Mondo awoke as the morning light passed over his face. As he stretched and yawned, Morning Sun, his wife, awoke too. Already, Wise One, his father, and Claw, his older brother, were up and talking quietly. As Mondo glanced about, others in their clan were beginning to stir.

Wise One dropped peeled stems of a tall prickly plant into the cooking skin along with some water. Later, cooking stones would be dropped in to boil the mixture for several minutes. The softened stems would then be stirred in the water till they became like a soup, and then he would drink it all, hoping to cure his sore back. As Wise One knelt slowly over the ash covered coals he gave out a soft groan betraying his pain. Blowing ashes off the coals he added some shavings of cedar bark to use as tinder. A couple of puffs of his breath were all that was needed to ignite tiny flames. Placing small twigs, more tinder, then larger sticks, the fire grew. Then he took the two small round cooking stones and carefully placed them into the fire and added more fuel. Getting up slowly he began to realize that after 52 winters he had better let the younger ones haul the elk quarters down from the high meadows, where the herds grazed this time of year. His main concern this morning, though, was not his aches and pains.

His band had come to this cave, to this valley, to these hunting grounds and berry

fields for as long as he could remember. The Mountain and its spirits had inspiredthem with many stories and good memories. As he waited for the fire to heat the stones, Claw and he were in serious conversation about the Mountain. When Mondo joined them, Wise One motioned for the three of them to hold a conference at the nearby overlook of the Cispus Valley. Morning Sun placed more fuel on the fire. She saw that the three band leaders were in what appeared to be a serious talk. Wise One was motioning his arms to the sky in the direction of the Mountain.

"Your ancestors told stories of the Mountain. They told stories of its anger...that it smoked...that sometimes every 5 or 6 generations its anger would rise and the Mountain would throw out huge hot stones that would burn your hands; yet when they cooled were as light as a songbird. They said smoke ran down the Mountain and devoured some of the tribe's elders. It ran many times faster than a deer could run and they could hear the screams of their elders in their dreams. Our tribe's fathers said dark clouds roared from the Mountain's mouth...would pass across the sun and our lands would become like night though it was day. The birds no longer brought music in the mornings. These huge clouds from the Mountain's mouth would drop not water, but dust and drops of stone as big as berries."

Morning Sun brought Wise One his drink. She'd already placed the smoking hot stones into the water of the cooking skin and stirred the bubbling mixture into a soup. Removing the stones, she poured the hot drink into a small tightly woven basket made of cedar root and long pine needles.

They stopped talking upon her approach, serious talk was not for a womans ear's. Smiling, Wise One took the basket and drank the whole mixture. He grimaced and quickly drank a few gulps of water to clear his mouth. Mondo and Claw chuckled at that, but knew he was feeling some pain to want that particular medicine. Morning Sun returned to the fire and rinsed the basket clean. She sensed the seriousness of their talk.

The rest of their clan, now up, sensed it too. Most had been with the hunting party yesterday in the berry fields. All had seen Wise One as he stood staring at the strange chalk colored cloud coming from the Mountains summit. He appeared mesmerized by how swiftly it had risen in the sky. They were always cheerful at summer camp because the Mountain's beauty seemed like a friend while in the berry picking fields, where they could see it clearly.

Hunting elk there yesterday had been a good idea because they could also determine when the berries would be ready to harvest. There were just blossoms now so they knew it would be about 18 suns before they should return. The berries, sun dried and dried in troughs dug next to hot coal filled pits, were an essential source of nutrition for their whole tribe. Their band always brought back the largest harvest. The whole mountain top of the berry fields, above the trees, was bathed in colors of yellow, purple, red, blue, and white.

Wise One turned to watch Doe Eyes as she knelt and gathered some blue starlike flowers growing close the to surface of the grainy alpine soil. Placing them around her head, the young girl skipped and pranced around her cousin Night Hawk as he sat quietly with his atlatl ready to kill elk flushed from the trees by other family members. Night Hawk was irritated and waved her off because he sensed a group of elk were approaching. Doe Eyes sulked back to the women were gathering herbs and her mother,Meadowlark, , was making berry baskets out of cedar bark collected on their way up to the fields.

Wise One's eyes went back to the strange clouds and his expression became serious again. The women all noted this and watched the cloud too, before going back to their tasks. They sang songs of the flowers as they worked. Until the elk came, Wise One studied the clouds and talked to himself most of the day.

Stealth, Claws son, hit the first elk to emerge from the trees with his atlatl, and Mondo the second. The rest of the men rushed forward with their spears to kill the wounded animals. They couldn't carry any more meat back so they didn't bother pursuing the three other elk flushed from the brush and had raced off back into another part of the forest. Their atlatl's were well made by Owls Beak, Night Hawk's father, who had remained back in the cave. He had injured himself seven summers ago and had become one of the best tool makers of the tribe, because he could no longer climb to the hunting grounds.

When the group returned to the cave at sunset, Owls Beak had replacement darts ready for Stealth's and Mondo's arrows. All the conversation over the fire and freshly cooked meat had been about the great skill of the hunters. Everyone shared; Doe Eyes sat near Night Hawk; and the men took turns singing new verses to old songs of great hunts. All except for Wise One. He said little and walked to the cave's entrance several times looking in the direction of the Mountain, though it couldn't be seen from the lower elevation of their cave. But he was looking to see if that ominous cloud from its summit was visible in the moonlight. He was the last to go to his sleeping mat that night.

Wise One's conversation began again as Morning Sun went back into the cave....

"Our ancestors said that during the last days before this happened the mountain would spit white clouds high above its peak like a warning it was angry....My sons, many summers we have come here, to this camp, to this cave. And I came with your grandfather here too. These lands have provided us with much game, the meadows have filled our baskets to overflowing with sweet berries, and the mighty Cispus has sent us more fish than the stars in the sky. Nearby we collect the white stone for Owls Beak to use to make our arrows sharp and true.

"But my sons...never have I seen clouds of smoke coming from the Mountain like I saw yesterday...and three suns ago I saw it too, but remained silent. My sons...I feel we must leave here now. The Mountain is angry again... and will loose its patience if we ignore its calls. Soon it will begin spewing its rage upon us again, like the old ones told us of the past."

Now Claw spoke...."Father I have heard your words. I too have seen the smoke. But our season is only half over...the berries are not yet ripe the big fish have not yet returned to our fishing holes on the mighty Cispus. We have much to do before the first snows. I do not think the Mountain will be unkind to us now. Its just breathing and sighing. Let us finish the season, then look to the Yakima people for a new valley to have for our summer camp."

Mondo listened quietly as Claw spoke. He too, had seen the cloud and had pondered the meaning of the smoke coming from its mouth. Now the accepted leader of the band, he thought long and hard before speaking:

"This cave has sheltered us, heard our stories, and felt the warmth of many fires. Owls Beak has made many fine tools for us in this cave. Our women have prepared many deer, rabbit, bear, and elk skins here, and have sewn them into clothing, slippers, blankets, tool carriers...here in this cave. They have dried and smoked meat and fish, and berries here for many generations. This beautiful valley has been home to deer, bear and birds many colors. Their songs have greeted us each day. Trees here have supplied strong branches for our spears and atlatls, and frame work for the skins to pull the heavy loads of our summer bounty back to our village. We have shouted of the valley of the Cispus in high voices around many council fires. The Great Cispus has washed

the dust from our skin, and cooled us in the heat; It has sent us more fish than the stars in the sky....Yes, this cave, the Cispus Valley, the high meadows have provided well for us. The Mountains spirits have guided our good fortune.

" Wise One knows the warnings of the past and the stories of the Mountain's rage and anger....And the Mountain again is casting its anger our way. I do not know what we have done to cause this. Maybe we took too many elk from its hills, or too many fish from its streams...only the Spirits know. But the Mountain is warning us now, as in the past."

"Claw speaks wisely in noting the hills not yet ripe with berries. Their blossoms this summer seem brighter than in past summers. He reminds us of the big fish which have not yet come to our fishing holes. These we always remember with joy because of the sweetness and nourishment our Mother Earth provides for us here. We always return to our village in the season of the first frost with the tribe's largest fish and the biggest berries."

"But, the Mountain is growing tired of our greed and won't wait. Its warning signs are themselves a gift to us. It must burn and cleanse the land. Maybe it seeks to punish others further away and we are in between. We must listen and respond. Our Mother the Earth has allowed us to prosper here....And our ancestors have passed the stories of the Mountain's anger down through the grandfathers. The spirits of the past in the Earth now speak loudly again...and we must listen.

"The berries may make the bears and the birds fat and plump-but they too will suffer when again the Mountain speaks. Let us begin now to prepare to leave. We will return to the village of our clan and see if others have seen these signs. Then if there is still time before the snows, we can hunt with our cousins, the Puyallup, seven suns towards the Big One. Today, we must cut strong branches to tie our skins to so we can haul what we have collected so far."

"We must leave here today; to not obey the Mountain would cause serious wrath to come upon all of our people."

They all agreed, and returned to the cave and its warmth. As they sat and ate the fresh meat and cooked roots collected by the women, Mondo told them all of the Mountain's warnings and the decision to return to their village. When some grumbled he scolded them, then directed everyone to specific tasks of preparation. Owls Beak hastily gathered all his tools that he could see, the bone chippers, and cores for microblades, as well as the darts and points he'd made for their summer hunts. He was sure to pack the black shiny rock he'd traded for from relatives across the big river; it made flakes for the sharpest knives. In his concern to make certain to pack the black shiny rock, he forgot his microblade cutter against the grinding stone always left near the fire ring. Leather straps made from elk and deer hides, long strings of sinew, and strips of cedar roots and cedar bark were all coiled and carefully placed in soft bags made of deer hide. Special core rocks gathered nearby were placed in other pouches so they wouldn't damage completed tools. All of these items would be placed and tied onto the elk hides stretched between the long branches the men would pull. The women gathered other tools into their baskets, smoked meat was wrapped and added to the loads. The young men returned with the long green branches, and the carriers were then assembled. Doe Eyes and Meadowlark returned with fresh herbs for food on their journey. Wise One and Chip, his grandson, went to the top of the mountain near their cave to see if the Mountain would speak again today.

Just after midday the band gathered outside the cave and looked back down the Cispus Valley again before they left. Wise One

spoke, "I have seen again the smoke from the Mountain. It is becoming darker and I fear it may be getting impatient with us."

Mondo then said, "Wise One, go to the overlook and speak to the spirits that our journey may be safe and the Mountain allow us to return some day to our summer camp in this cave."

Upon Wise One's return, the clan began their descent to the valley floor. They kept going until dark and made a temporary camp late that night in the valley of the Big Bottom.

The next morning a thundering explosion jerked them awake. The concussion of the explosion was followed by a deafening roar; a blast of warm air came over them and rushed across the valley. The trees bent from its force waved like grasses. The band huddled in the overhang of a cliff that looked across the Big Valley. Terror was in their eyes as the sky began to darken from a huge cloud. Small sharp edged stones began falling from the cloud; some bounced into their shelter. The air was thick with these stones. It was difficult to see more than two spear lengths out of the shelter. Wise One began chanting something in the old language to the Great Spirit. It stayed dark the whole day. They stayed there.. waiting...not knowing what would happen next, but trusting their appeals to the Great Spirit would keep them safe. They nibbled on small amounts of herbs and smoked elk, and drank small allotments of water stored in skins. The next morning came without the normal bird chirps. It just became gradually lighter to reveal a ghostly scene. There was no more wind. Trees nearby appeared to be covered with dust or snow. On the ground everywhere was a thickness of berry-like bits of rock that rained down from the clouds the previous day and night. It was so thick that no flowers and most bushes could be seen and it covered the whole Big Valley. Everywhere, it was as bright as the sun's morning light reflected off the surface. It was like nothing they'd seen or heard of before.

At last the silence was broken by whimpers of fear from Doe Eyes. Mondo got to his feet and said, "Everyone eat now, drink what's left in the skins. We must hurry to the village to see if anyone is left there."

The Village was located up a valley towards the setting sun. Traveling was difficult and awkward. The surface was mushy from the showers of rain and every step was a labor. The mushy soil wore new moccasins smooth. Milky water of the Cowlitz river was especially distasteful. The quietness as they traveled worried them, but no one spoke. Everyone wondered worriedly if the other bands had made it back.

Late that afternoon their questions were answered by wails and cheers from a few of their tribe still in the village. A few of the old ones were all that remanined in their tribes main camp. Two bands, Jeruds and Smoke, had not returned. The rest of the tribe, some 140 men and their families, had packed up and moved west to the lands of the big water.

They never found out what happened to the other two clans. There were no berries that year. And the clan of Mondo never went back to the cave.

LIGHT IN THE DARK: The Braille Trail

Focus To learn about forest ecology utilizing senses other than sight. Guided inquiry is used on an existing path designed for the sight impaired.

Group Size Up to 20, with students working in pairs.

Time Required 1.25 hours

Materials
Clipboard
Good blindfold
Writing tools
Partner
Handout: ***Light in the Dark: The Braille Trail***

Physical Setting The Cispus Braille Trail (*from the Education Building follow the short trail that leads to the main road and painted crosswalk. Once across the road you will see the wooden sign designating the beginning of the Braille Trail.*)

Process

1. Pair up your students. The sighted student will act as guide and recorder, the blindfolded student will act as the "observer". Half way through the course they should switch roles. Adults or counselors should be posted at a few points along the trail just to ensure all is going properly (they shouldn't interact unless needed).
2. The blindfolded person should place their right hand on the rope and follow along the path, maintaining contact with the rope at all times. Their guide can help through verbal directions to make some observations away from the rope. Along the rope are small circular metal tags with numbers and Braille symbols for the corresponding numbers. The pair should stop at each of these points and answer the same numbered question in the activity.
3. The guide may have to give verbal clues in order to find some items to examine. The guide will read questions, and record answers accurately.
4. In addition to learning from observations made using senses other than sight, the trust-responsibility-communication relationship developed between the observer and guide/recorder will be especially important. The last few questions, 13, and 14, will address this topic.

Option:
Use a portable cassette recorder to record the dialogue between the guide and observer, and play back later.

Light In The Dark: The Braille Trail

1. At the start of the trail (before you pass the sign) , to your left, at about knee level, is a rotting log. Reach down and touch it. Allow your hands to move along the log (your guide will help you rejoin the "lifeline" after examining the log).
   a. How does this rotting log feel?

   b. How could it support new life?

   (Return to the lifeline, take a deep breath, smelling the air in this spot. Begin walking, using the rope to guide you. Your next stop will be a half dollar sized disc attached to the rope with the figure 2 raised on the surface with the Braille symbol)

2. With your right hand on the rope near the #2 reach your left hand out and find the trunk of a broadleaf maple. Feel the trunk.
   a. What is found there besides the bark? How does it feel?

   b. Reach with your left hand back about 1 foot from the broadleaf maple and find the trunks of four smaller trees. How do they feel different? These are vine maple, and commonly grow in groups.

3. Have your guide help you find the evergreen tree on the left; feel it.
   a. How is it different than the maples'?

   b. What would you guess its age to be?

4. Find the smaller smoother trees near the evergreens (your guide will help you).
   a. These smaller trees all seem to be leaning one direction. Why do you suppose this is?

   b. Slowly turn in circle. What did you notice about the the direction in which they lean?

5. Reach over the other side of the rope and find several small evergreens. They are not all the same variety. Feel and find the different tree.
   a. How are most of them alike?

   b. How is the one Douglas fir different?

6. You have come to a new section of the woods. Sniff the air and sense the difference.
   a. How does it "taste" different from earlier in your trek?

   b. How is the temperature different here, to what do you attribute this difference?

THE GUIDE NOW TAKES THE BLINDFOLD AND YOUR ROLES CHANGE

7. The guide needs to direct you with verbal clues to the big tree. Study this tree with your senses.
   a. How would you describe its "bigness"?

   b. This single tree is most responsible for others of its kind for being here, explain.

(Give the tree a hug before going on to #8.)

8. Guide, direct your partner to the large nurse log.
   a. Feel this ancient tree. How many different kinds of plants can you find growing here?

   b. What animals, big or small, might use this log for some purpose? Name some and explain how they might use it:

9. Describe a number of different ways this site is different than the last.

10. How does this spot feel different from the last?

    a. There are a number of vine maples curving nearly overhead; knowing that, how do you feel now?

    b. As you leave the creek note how the sound changes. Does anything else change too?

11. Guide, take your partner to the large cut tree trunk. Feel the annual rings indicating the age of the tree. Estimate the age of this tree.

    a. Find the center of the tree with your fingers. Your fingers should tell you that this tree wasn't exactly round. Why was this so?

12. This is the last stop. How is this area different than that nearer the creek?

    a. What sounds are new?

    b. How is this area different than what you both felt at the beginning of the Braille Trail?

Remove the blind fold and proceed to the end of the Braille Trail. Take notes below on the new things actually observed with the aid of your eyes. Use describing words that help depict size and color.

MT. ST. HELENS 2000

Focus To create a literary time-line of recovery for Mt. St. Helens' environment using creative writing skills. This is a post-Cispus/Mt. St. Helens activity. *Uses information learned in* ***Mt. St. Helens Eco-Comparisons*** *(p. P16).*

Group Size Entire class in groups of 1-8 students

Time Required Research *(variable)*
Pre-write (*30 min.*)
Writing (*30 min.*)
Sharing (*30 min.*)

Materials Videos
Paper
Pencil
Newspaper and magazine articles
Field trips to Mt. St. Helens Interpretative Centers

Physical Setting Classroom or Pavilion

Process 1. After students have gathered information through any and all avenues available to them, they are to produce a document which shows change in an area of Mt. St. Helens which was greatly affected by the May 18, 1980 eruption. Example on following page.

2. Students may produce a story, collage, or anything in between which displays the changes (over time) in Mt. St. Helens' ecosystem.

3. If this is a straight individual writing project the activities and times will follow the lesson times given above. If students work in groups the times must be increased.
Sharing of information between groups is important.

Example: INDIVIDUAL INSTRUCTIONS
I. You are to remember (or record) all of the information that you received when:

1. We went to the Mt. St. Helens Visitors' Center
2. We saw films about the 1980 eruption
3. What we saw when we went up on Mt. St. Helens while we were at Cispus.
4. Any information from hand-outs or booklets
5. And from any other source

Example Worksheet

This is meant only as a starting point

Complete the following:

If we took an area (such as the Lahar mud flow, on the south side of Mt. St. Helens or Windy Ridge on the north side) that appeared to be completely bare of all live plants and animals in June 1980, and returned on June 1st of each year, what would you expect to find? List your ideas in the appropriate time slots below. (*Use photographs, news reports and your personal observations while you were at Cispus to complete the information grid. Possible things to include in your literary time-lines. What surprising things did you notice? Which plants and animals do you think were survivors and which migrated into the area?*)

Years	What Plants	What Animals	Soil Changes	Water Changes
1980-85				
1985-90				
1990-95				
1995-2000				

II. Using the information above, write a newspaper article for the Columbian for May 18, 2000 with the title "*Mt. St. Helens: 20 years later.*" Be sure to include Who, Where, When, What, and Why.

P15

MT. ST. HELENS ECO-COMPARISONS

Focus To investigate the differences in ecosystems between three areas starting at the edge of the Mt. St. Helens' Blast Zone and proceeding to Windy Ridge near Mt. St. Helens' Crater

Group Size A bus load: approximately 60 students plus counselors

Time Required 6-6.5 hours, see detailed schedule below

Materials

- Mint Life Savers
- Cameras
- Water test kits
- Soil test kits (*Lamotte*)
- Sack Lunch
- Plastic-lined paper bags (*for motion sickness*)
- Activity sheets

Physical Setting Mt. St. Helens Volcanic Monument
Bear Meadow, Meta Lake, Windy Ridge

Process

1. Transport Students to the three sites using a school bus. Be sure to have the bus driver take his/her time to minimize motion sickness. Also arm counselors with motion sickness sacks and a roll of mint life savers. Leave Cispus at approximately 8:45 and travel to Bear Meadow (approx. 60 min).

2. At Bear Meadow students observe and record information concerning types of plants, animals, soil conditions and water forms present at the edge of the blast zone (approx. 30 min).

3. Travel to Meta Lake (approx. 15 min). Have students observe and record information concerning types of plants, animals, soil conditions and water present at Meta Lake. Divide the 60 students into 3 groups for the 3 sites. At 20 minute intervals the groups rotate until all three groups have visited all 3 sites. An adult accompanies each group along with 3 counselors. Some bus drivers are willing to be actively involved with a group. Total time is about 75 minutes, including rotation time.

GROUP 1 starts with a discussion and observations of the area from the miners' car; including past multiple use of the area vs. monument status, topography (why trees that were blown down are lying the direction they do), why plants have come back where they have.
GROUP 2 starts at the road cut near the trail to Meta Lake. They take the pH and temperature of the soil in various spots and depths along the road cut. They also make observations on plants and animals present.
GROUP 3 starts at Meta Lake to determine the dissolved oxygen, pH and temperature of the water at Meta Lake. They also make observations on plants and animals present.

4. Now travel to Windy Ridge (approx. 15 min). Eat lunch in the amphitheater over-looking Mt. St. Helens and Spirit Lake. Sometimes a Forest Service interpretive guide is present to lead a discussion during lunch. After lunch hike to the top of Windy Ridge and observe soil, water, plants and animals present. Be sure to have students take their cameras.

5. Point out the different volcanoes visible from Windy Ridge. Also point out how the "Tidal" wave has stripped the soil from the ridge which runs from the north into Spirit Lake. This "Tidal" wave was produced by the avalanche during the Mt. St. Helens May 18, 1980 eruption. This effect has been called the "Bathtub Effect"

Attached is a set of student pages to help record and compare the differences in the ecosystems of the Mt. St. Helens area.

MT. ST. HELENS:
MT. ST. HELENS STUDY
INTRODUCTION TO A VOLCANO

Name_____

Teacher_____

I. As we move by bus **up** the foot hills of Mt. St. Helens we will see **changes** in plants, soil, water, and animals. List some of the changes that you notice. Example: What kind of water is present, standing, running, dew, etc.? What kinds of plants and animals can use this kind of water? Write some of the reasons that you can think of for these changes. Scientists do not know all of the reason for the changes you see, so be sure to write down your reasons.

Area name	Change Water, Plants, Soil, Animals, Other	Reason for Change
Green forest		
Bear Meadow		
Blow-down Area		
Meta Lake		
Windy Ridge		

MT. ST. HELENS STUDY:
BEAR MEADOW HABITAT

Name_____

Teacher_____

B.I. Describe the Bear Meadow area completely, being sure to include any evidence that there was a volcanic eruption in this area. Look close to you as well as far away.

_____

_____

_____

_____

_____

B.II. What plants do you find in this area? Fill in the chart below.

What plants do you find here. Were they here before the eruption (survivors) did they move in later (pioneer) Name or describe them	What do these plants need to live here?	By living here, how will these plants change this area?

B.III. What animals (or animal signs) do you find in this area? Fill out the chart below.

Name or describe each animal that you find in Bear Meadows (evidence)	What does each animal need to live here?	By living here, how will these animals change this area?

P19

MT. ST. HELENS STUDY:
BEAR MEADOWS HABITAT CONT.

Name_____

Teacher_____

B.IV. What is the soil like at Bear Meadows? Fill out the chart below.

Name the soil location "Road cut near.." What layer of soil?	pH acid base	Texture, feel	Temp.	Moisture wet or dry	Evidence of plant/animal

B.V. What is the water like at Bear Meadow? Fill in the chart below.

What water are you testing? Where? Describe it, are you near the edge, middle, etc. of the stream, lake, swamp	pH acid base	Temp.	Dissolved Oxygen. Your group will take a sample and fix the oxygen then complete the test at camp	Evidence of animal or plants

B.VI. Other Observations:

P20

MT. ST. HELENS STUDY:
META LAKE HABITAT

Name_____
Teacher_____

M.I. Describe the Meta Lake area completely being sure to include any evidence that there was a volcanic eruption in this area. Look close to you as well as far away.

_____

_____

_____

_____

_____

M.II. What plants do you find in this area? Fill in the chart below;

What plants do you find here. Were they here before the eruption (survivors)? Did they move in later (pioneer)? Name or describe them.	What do these plants need to live here?	How will these plants change this area by living here?

M.III. What animals (or animal signs) do you find in this area? Fill out the chart below.

Name or describe each animal that you find in Meta Lake (evidence)	What does each animal need to live here?	How will these animals change this area by living here?

MT. ST. HELENS STUDY:
META LAKE HABITAT CONT.

Name_____

Teacher_____

M.IV. What is the soil like at Meta Lake? Fill in the chart below.

Name the soil location "Road cut near.." What layer of soil?	pH acid base	Texture feel	Temp.	Moisture wet or dry	Evidence of plant/animal

M.V. What is the water like at Meta Lake? Fill in the chart below.

What water are you testing? Where? Describe it: are you near the edge, middle, etc. of the stream, lake, swamp?	pH acid base	Temp.	Dissolved Oxygen Your group will take a sample and fix the oxygen, then we will complete the test at camp	Evidence of animal or plants

M.VI. Other Observations:

MT. ST. HELENS STUDY:
WINDY RIDGE HABITAT

Name_____

Teacher_____

W.I. Describe the Windy Ridge area completely being sure to include any evidence that there was a volcanic eruption in this area. Look close to you as well as far away.

_____

_____

_____

_____

_____

W.II. What plants do you find in this area? Fill in the chart below.

What plants do you find here. Were they here before the eruption (survivors)? Did they move in later (pioneer)? Name or describe them.	What do these plants need to live here?	How will these plants change this area by living here?

W.III. What animals (or animal signs) do you find in this area? Fill out the chart below.

Name or describe each animal that you find in Windy Ridge (evidence)	What does each animal need to live here?	How will these animals change this area by living here?

MT. ST. HELENS STUDY:
WINDY RIDGE HABITAT CONT.

Name_____

Teacher_____

W.IV. What is the soil like at Windy Ridge? Fill in the chart below.

Name the soil location "Road cut near.." What layer of soil?	pH acid base	Texture feel	Temp.	Moisture wet or dry	Evidence of plant/animal

W.V. What is the water like at Windy Ridge? Fill in the chart below.

What water are you testing? Where? Describe it: are you near the edge, middle, etc. of the stream, lake, swamp?	pH acid base	Temp.	Dissolved Oxygen Your group will take a sample and fix the oxygen, then we will complete the test at camp	Evidence of animal or plants

W.VI. Other Observations:

PHYSICAL RELIEF AT CISPUS

Focus To learn about features of the Cispus area.

Group Size Entire class

Time Required 3, one hour periods

Materials
Topographical map of the Cispus area - duplicated.
Carbon paper
Cardboard or tag board(*depends upon amount of relief desired*)
Pencil shavings or sawdust
Elmer's glue

Physical Setting Classroom, pre-teaching the area prior to arrival at Cispus.

Process

If you want to prepare materials for your students, get enough cardboard for each of the contour lines on the contour map. It is easiest to precut the layers with a jigsaw, using 8 1/2 x 11 pieces of cardboard. If you want to let the kids do the cutting (with X-acto knives) it is probably better to use tag board.

1. Trace the contour lines onto one layer of cardboard. Put multiple pieces in a stack, using C-clamps to keep them together. Cut the pieces and put similar elevations in a marked container. Repeat with each elevation. Some elevations may have multiple pieces representing different mountains.

2. Have children pick up a piece from each container, labeling each piece with its elevation.

3. Each child should have a topographical map as a reference in placing the pieces. After positioning, students should glue the pieces.

4. To add texture and smooth the contours "paint" the surface of the completed layers with Elmer's glue and put pencil shavings over the surface.

5. Paint the geographical features onto the completed map i.e., Tower Rock - gray, the mountains - green, rivers and streams - blue or green, roads - black, trails - red, etc.

6. Be sure to bring the maps along and see if the kids can orient themselves to their surroundings.

PINTO ROCK: VOLCANIC PLUG

Focus To use field observation and guided inquiry to learn the origins of many mountains in the area between the Cispus Center and Mt. St. Helens. Students will employ some creative writing skills.

Group Size Maximum 35 (*limited to number of vans available*)

Time Required 1.25 hours driving
1.25 hours activities

Materials Whistle Sketching pens Clipboard/flat surface
Gifford Pinchot National Forest map
Handout: ***Pinto Rock: Volcanic Plug***

Physical Setting Pinto Rock

Process 1. Drive out of the main entrance to the Center, and turn left. Go to the stop sign by the Yellowjacket Creek bridge, and turn right onto road 28. Check your odometer mileage at this point. Follow the signs toward Mosquito Meadows. At about 9-10 miles from the stop sign, pull off when you can see Pinto Rock clearly (there will be signs nearby identifying Pinto Rock). Do the first few activities.
2. Return to the vans and proceed to the Pinto Rock turn-off another 1-2 miles up the road. Turn right onto road #77 and drive 2 miles to the Pinto Rock parking lot. Pull-off near Pinto Creek (9-10 miles from stop sign near Yellowjacket Creek bridge), and at Pinto Rock base . There is a steep path about 200 yards long from the parking area to the actual base of Pinto Rock. Before allowing students to go up the path, caution them to be conscious of safety, and have an adult go up the path first and remain near the top to monitor student behavior. Students will complete the rest of the activities there. Use the whistle or a van horn to signal return to the vehicles. The adult should remind students again about safety precautions before they descend the path.

FACTS TO KNOW: Pinto Rock is basically a volcanic plug. The magma came near the top of a vent, stopped and solidified. Over the centuries the surrounding mountain weathered away leaving behind the grotesque landform of Pinto Rock. It is 5113 feet above sea level. There are a number of similar rocks, or peaks in the area, but none as accessible as Pinto Rock.

Pinto Rock: Volcanic Plug

1. In the space below draw the panorama around Pinto Rock.

2. Now, from this vantage point, draw a close-up of Pinto Rock itself.

3. How do you think Pinto Rock was formed?

4. How far is it from where you are standing to Pinto Rock?

5. Looking at Pinto Rock from the parking area, describe your feelings and impressions now that you can see it up close.

6. What is the source of the granular particles in the soil?

7. Examine Pinto Rock up close. Describe its general appearance.

8. Standing next to Pinto Rock, describe the appearance (textures) of 1 square foot of the rock.

9. Move carefully around to the side of the rock near the road. Describe what it was like here at 8:30 a.m., May 18, 1980.

10. Looking at the surrounding area, what animals probably make their homes here?

11. Carefully return to the parking lot using the established path. Now that you've seen Pinto Rock up close and from different angles, draw one more picture of it that includes some of your impressions and feelings.

12. Compose a poem (like a diamante, or haiku, or...) that helps express what you are seeing and feeling.

SILENT VOICES, VITAL CLUES

Focus To learn about Layser cave, even if weather or transportation problems don't allow your group to visit the actual site.

Group Size Entire class

Time Required 40 minutes

Materials
VCR
Pen/pencil
Writing surface
Film: *"Layser Cave: Silent Voices, Vital Clues" (20 min.)*
Handout: ***Silent Voices, Vital Clues***

Physical Setting Standard Classroom

Process

1. Have a VCR set up and ready to go, be sure to preview the film before showing it.

2.Tell the students about Layser Cave.

Layser Cave is a large cave (60 x 40 ft., with a ceiling 10 ft high in the center) a few miles from Cispus that had been used for several thousand years by local Native Americans. Its use continued until 3,500 years ago, when it was abandoned for unknown reasons. The cave was rediscovered in 1982 by a person working for the Forest Service, his name was Tim Layser, and the cave was named after him.

3. Show the film to the students. The film tells the story of Layser Cave's discovery, the vandalism and theft of artifacts, subsequent excavation by archaeologists, and conclusions made based on their findings. Afterwards, complete the handout and discuss the activity.

Silent Voices, Vital Clues

1. How was Layser Cave discovered?

2. What did Tim Layser see that lead him to believe the cave could be an archaeological site?

3. Describe what happened before the site could be scientifically excavated?

4. Why were these actions illegal?

5. How did we lose as a result of these actions?

6. How is a scientific excavation conducted?

7. What sort of tools were used to excavate and process the found artifacts?

8. What types of specialists were involved in the entire excavation process?

9. List and describe at least 5 of the artifacts found at the site.
1. 2.
3. 4.
5.

10. What do these artifacts tell us about the people who lived here?

11. How did the scientists determine the age of the artifacts?

12. What should you do if you find an artifact (like an arrowhead) while on public land? Why can't you keep it?

13. Based on what you've seen , how important do you think an archaeologist's job is?

STONE AGE TOOL MAKING

Focus To understand the skills and materials used by Native Americans to make tools and weapons by observing a demonstration by a local professional flint knapper.

Group Size 15-30

Time Required 1-2 hours

Materials 2 large tables set up end to end
Chairs set up close in semi-circular arrangement
Resource Person: LARRY NELSON, local #: 497-5630
Handout: ***Stone Age Tool Making***

Physical Setting Cispus Center, large classroom

Process *Make arrangements with Larry Nelson at least a month ahead of time (although at times he's available within a few hours notice).*

Larry is a professional flint knapper as well as a specialist in law enforcement pertaining to archaeological sites and artifacts. He has a slide show that would add 1/2 hour to 1 to hour the program.
He likes to speak about the law and archaeology sites, local Native American culture, and the manufacturing of replica artfacts. He has a display of actual and replica artifacts and demonstrates the manufacture of sample points. He shows the varied materials used and allows examination of many items in his display. His presentation can last up to 3 hours (with breaks) if needed.

STONE AGE TOOL-MAKING

1. What materials did Native Americans use in making tools and weapons?

2. What specific kinds of rock were used?

3. Which rock was favored by Native Americans?

4. Where were the best source areas for this rock?

5. How did Native Americans here obtain samples of this rock?

6. What rock material was available locally?

7. What was the purpose of "heat treating" projectile points, blades and stone knives?

8. Which kind of stone provided the sharpest cutting edge?

9. What is an "atlatl"?

10. Which was used first, the atlatl or bow and arrow?

11. Just how effective was an atlatl?

12. How and why was the atlatl's design changed?

13. How has Mr. Nelson changed his artifact-making tools from those originally used by Native Americans?

14. List 3 or more new things you learned from Mr. Nelson's talk and demonstration.
    1.
    2.
    3.

15. What is the purpose of the small stone tied onto the atlatl?

16. Why do we all lose if artifacts are removed from where they are found?

17. If you came upon something that looked like an artifact while walking in the forest, what should you do?

18. What motivates some people to rob Native American gravesites?

THE DIG

Focus To encourage an appreciation for prehistoric occupation of an archaeological site, through visitation, guided inquiry, and poetry.

Group Size Entire class

Time Required 1 hour

Materials
Flashlight Pens/pencils
Writing surface Cispus of School District passenger vans
Handouts:
"*The Dig*," by Tim Lichen
The Dig--Layser Cave

Physical Setting Layser Cave

Process

Activity 1: GETTING THERE

1. Drive out the main Cispus Center entrance, turn left and continue 1 mile along the road until you come to a stop sign. Turn left again, crossing Yellowjacket Creek. You will cross the Cispus River after 1/4 mile, continue driving until you reach the next stop sign. At the sign turn left, heading towards Randle. After 2 miles you should see a small sign for Layser Cave. Turn right, onto the indicated road, driving 1 1/4 miles to a small parking area. The road is gravel and steep in some places, but safe.

Activity 2: LAYSER CAVE

1. Walk across the road to the Layser Cave trailhead. Proceed a short distance to the first interpretive display board and discuss it with your students (especially note that the atlatl preceded the use of the bow and arrow).
2. Then continue to the Cispus Valley overlook, taking the left fork of the trail. Look at the view, imagine how many others have stood here before you. Read the interpretive display, see if you can identify landmarks.
3. From the overlook, take the right fork of the trail to the cave entrance and interpretive display.
4. Before entering the cave, remind students they are entering a summer home used by Native Americans, then abandoned suddenly 3500 years ago, never to be used again until it was rediscovered in 1982. They can pretend that with each step into the cave they are going back 500 years (about 7 steps) to the time when the cave was used.
5. Quietly enter. Have everyone get comfortable, and then read "*The Dig*," a poem by Tim Lichen about the cave and the archaeological excavation.
6. After reading, complete the handout ***The Dig--Layser Cave***.

The Dig

by
Tim Lichen
September 20, 1990

Indian Summer shines where it has not shown for centuries;
beaming into a hole torn into the Earth.

In the trenches we find treasures from another time:
chips and chunks, flakes and points;
vignettes of a stone-poor culture.

Who were the people who sat here before,
where we sit today?
What stories did they tell,
songs did they sing,
plans did they make?
Had they any idea of people beyond their own lifetime--
of we,
who now touch their past?

And I wonder if the future will be as interested in rescuing
the refuge we leave behind--
in some Indian Summer
many centuries from now.

The Dig--Layser Cave

1. What is the poem referring to when it speaks of a "...hole torn into the Earth."?

2. Why were "chips and chunks, flakes and points...," referred to as treasures?

3. From what you have learned from the interpretive displays along the trail, describe the people who spent their summers here 4000 years ago:

4. "What stories did they tell...," as they spent their nights here?

5. What "songs did they sing...," as they sat around the fire?

6. What "plans did they make...," as the season progressed?

7. Do you think they ever thought of a future 35 centuries (3500 years) away?

8. Will people 35 centuries from now show the same curiosity for our culture that we have shown for this cave and other archaeological sites? How will our sites be examined? What new technology can you imagine will be used?

9. What artifacts will we leave for future archaeologists? List 10 items that you think might be found of our culture:

10. Using your list of artifacts, what do you believe these archaeologists will learn about us, our values, beliefs, lifestyles, and technology?

11. What items would you NOT want them to find? Why not?

WHERE WAS THAT ?
revisiting the Braille Trail

Focus To note details, locations, and relationships of both natural and man-made sites in a specific area for the purpose of making a detailed map.

Group Size Entire class up to 20; divided into small groups of 3-5

Time Required 1 hour

Materials
1 camp map
1 enlarged copy of Braille Trail map per group for rough drafts
Paper and pencils for recording observation information
1 copy of Braille Trail map for each student for final copies
Colored pencils, fine tipped colored pens etc.

Physical Setting
Indoor classroom or outdoor area with tables
Braille Trail

Process

Activity 1: GETTING READY
A. Discuss map of camp; note important information provided to make a group legend .
B. Discuss the Braille Trail, its setting and purpose and the experiences of the group if they have done a "blind walk" on the trail.
C. Present task

Activity 2: WALKING THROUGH
Large group: With NO maps, pencils, pens, etc., walk the Trail discussing marked sites, natural features between sites, relative distances, plant growth, etc.

Activity 3: REVIEWING AND RECORDING
Small groups
A. Group members discuss their recently gathered information, plan strategies for organizing information, and compiling it on their rough drafts.
B. Walk the Trail in groups making a single rough draft with legend.
C. Return to tables.

Option:
To increase the challenge, students could draw their own maps rather than recording the sites on the individual maps.

ACTIVITY 4: CARTOGRAPHERS AT WORK
At the tables each person will use the information gathered by the group and record it on individual maps. Display maps in cabins or dining hall.

Careful Consideration

AIMING FOR SAFETY

Focus To train students in the necessary safety precautions required to practice archery.

Group Size 10-12 students

Time Required 10 minutes

Materials
Targets (*set up at the archery site*)
Bows & arrows
Arm guards and finger (*opt.*)
Adult who is a designated safety coordinator

Safety
Hair tie for longer-haired students
Snugly fitting clothing w/o front pockets or large, loose collars
Necklaces should be removed, or tucked underneath a shirt.

Physical Setting All archery at Cispus must be done at the archery site. The site is located at the end of Lassoie Way, behind the bird blind and the houses. Check with the office to make sure that anyone using the ACE course is aware that archery is occurring.

Process

Before students handle any archery equipment they must receive safety training.

1. Demonstrate to students how to string a bow. Explain top and bottom of bow, and teach names for parts of the bow. Have each student string and unstring a bow.
2. Show students the different parts of an arrow and explain each part's function. Demonstrate why the one odd-colored feather (cock feather) on each arrow needs to point away from the bow, when loading the arrow onto the bow (if loaded any other way the feathers will catch on the bow when the arrow is shot).
3. Make sure that no one loads an arrow until the safety training is complete!!! When loading the arrows, have students in single file lines behind each bow. It is a good idea to have only one bow for each target. Have the adult show the students how to load, sight, and shoot an arrow. Be sure to emphasize the importance of never pointing a loaded bow at another person! Students must also never walk in front of anyone who has a loaded bow. Let each student practice shooting a few arrows. Make sure all bows are put down before allowing students to retrieve the arrows that were shot.

It is very helpful to have a verbal or whistle signal to commence shooting, laying down bows, arrow retrieval, and stop shooting/emergency. Allow students to nock or load arrows only after signal is given.

Resources:
Bows, arrows, quivers and wrist guards are available in the Recreation Storage Room in the Education Building. The CispusLibrary has three books on archery equipment and technique. The books are:

The Complete Beginner's Guide to Archery, B.A. Roth, call # 799.3 RO.

Archery, Ronald Sports Library, Natalie Reichart and Gilman Keasy, call # 799.3 RE.

National Archery Association Instructor's Manual, Baier, Bowers, Fowkes, and Schoch, call # 799.32 Na.

R1

BE PREPARED, OR...!?

Focus To use guided inquiry, discussion, and observation to understand the ease and necessity of traveling with survival materials.

Group Size 16-20 students maximum

Time Required 20-50 minutes (*with extensions*)

Materials Pen, pencil
Writing surface (*clipboard, notebook*)
Handout: ***Be Prepared, Or...!?***

Physical Setting Survival-Mountaineering Room

Process

Activity 1: "Be Prepared, Or ...!?"

1. Take your group into the Cispus Survival-Mountaineering Room located near the library in the Education Building.
2. Allow time for the students to examine the room on their own-about 5 minutes.
3. Direct your groups attention to the activity, **Be Prepared, Or...!?**
4. Divide your students into smaller groups to work together cooperatively.
5. You may want to brainstorm with the whole group for question 9; here are some possible responses: "Never travel alone....tell someone not in your hiking group specifically where you are going....register with a local Ranger Station."

BE PREPARED, OR...!?

1. Examine the, "Do It Yourself Pocket Storm Survival Kit," shown on the wall. Since hikers are usually concerned about weight and space, estimate the combined weight of the objects shown. Estimate the amount of space, or size of container needed to place all the objects shown.
   Weight _____ Container Size _____

2. List any additional items you would include-keeping in mind the needs of light-weight, and small space. (List at least 3)
   1. _____ 2. _____ 3._____
   4. _____ 5. _____ 6._____

3. Look at the photograph of the climber next to the windows. Is there any single item the climber could safely do without?
   _____
   If, "yes," then name it/them here:
   _____

4. Are there any particular items not shown you think should be present? List them here.
   1. _____ 2. _____ 3._____

5. On the wall are shown items used in the outdoors and in climbing from an earlier time. Discuss, then explain below how some items have changed.

6. What are the main advantages of modern equipment? What are some of the new materials used, not present in the older gear?

7. Most people using the forest lands aren't climbers. What are some essential items that should be taken for a two night stay in the wilderness? (List at least 5, with the top 5 being absolutely essential)
   1. _____ 2. _____ 3. _____
   4. _____ 5. _____ 6. _____

8. Name the items on your list that can be easily located now in your home.

9. Even people who have the essentials, and are physically fit, get themselves in life-threatening situations, like hypothermia or falling and injurings themselves, or losing equipment. What else should you do when traveling in wilderness areas?

   1. _____

   2. _____

   3. _____

10. What kind of information would be helpful to know for your trip when stopping at a ranger station?

11. What kinds of things do you think the ranger will ask you, and tell you?

BY NATURE'S RULES

Focus To acquaint students with the dangers of traveling in the mountains unprepared, using film observation, a written activity, and discussion.

Group Size 20 students

Time Required 1 hour

Materials Pen, pencil
Film: *"By Nature's Rules"*
Handout: ***By Nature's Rules***

Physical Setting Your own classroom, or the Cispus Center Survival and Mountaineering Room

Process

Activity 1: BY NATURE'S RULES

1. Make copies of the handout by the same name.

2. View the film, *"By Nature's Rules."*

3. The students may complete the handout, or use for discussion purposes.

4. Stop the film after 5 minutes; have students answer questions 1-5, then proceed the rest of the way through the film.

Extensions:

1. Have your group examine displays in the Survival/Mountaineering Room, especially the Survival Kit.

2. Have your group make their own lists of things for a survival kit.

3. Have your group make a list of thing to do to prevent hypothermia.

4. Do Activity, ***Do-It-Yourself Survival Kit***, pp. SN-2,3,4 *THE CISPUS EXPERIENCE*.

By Nature's Rules

1. What do the newspaper headlines say about the friendliness of nature?

2. Why would an experienced outdoorsman just sit down and die?

3. What are some facts the doctor explains about hypothermia? (list at least three)
   1.
   2.
   3.

4. Why doesn't a victim do something to help her/himself when they have the
   means to do so?

5. Which person in the movie is most like you?

6. In what ways are some in the hiking group unprepared? (find at least three)
   1.
   2.
   3.

7. When does this group respond to being wet? When should they have protected themselves?

8. What is the material in Dan's pants that will keep him warm?

9. How does being wet next to your skin affect your body's ability to maintain your body temperature?

10. Why didn't the group stop sooner to get on warmer clothes?

11. What kind of a person did this group of hikers lack that every group traveling together should have?

12. When some of the hikers started tiring and getting cold and wet, what did they decide to do?

13. What early signs of hypothermia did Martin show?

14. What did Jill forget at one stop? What ability was she losing as hypothermia began to take over her body?

15. At mid-day what important fuel building activity was ignored?

16. Although Peter was strongest, what was happening to him?

17. What happened to Jill? Fully describe her symptoms.

18. When Don finally took charge, what were some of the things he did to help? (list at least four)
    1.

    2.

    3.

    4.

19. Why couldn't Peter help himself to get warm?

20. How did the person you identified with fare?

HANG ON!

Focus To equip students with strategies to help them control fear and panic so positive decisions can be made in a survival type situation.

Group Size Small group or Entire class

Time Required 45 minutes

Materials Journals or teacher prepared handouts
Pencil
Blindfolds

Physical Setting Classroom and trail

Process

1. Review priorities of life through discussion. Review S.T.O.P. (Stop, Think, Observe, Plan) and the concept that potential for survival is enhanced when fear is controlled to allow calm, positive decisions to be made.

2. Members of group share experiences where they felt lost, afraid or threatened and how that problem was resolved.

3. Teacher input: FIGHT or FLIGHT... Neither will help in survival situation. Both are potentially destructive.

Deep Breathing Technique:
-Long slow breath in (5 counts)
-Hold breath (5 counts)
-Slow exhalation (5 counts)
-Repeat sequence ten times

4. Teach Deep breathing technique for calming and overcoming panic. Practice breathing. Discuss the calming effect they experience. Their reactions may be recorded in their journal.

5. Teach the "holding on" technique. Having something to hold onto can provide a sense of security. Have students stand on one foot and move about without holding onto any object or person. Discuss how having something to hold onto increases their feeling of security.

6. Trail simulation (Use any trail near Cispus campus)
Situation: Students pretend to be lost in woods at night. To simulate situation, use blindfold. Have students move about and describe their feelings and reactions. Have students hold onto tree, stump, log, or other object. Have them describe how having something to hold on to helps to provide sense of security.

7. Students can write in journals about this experience and about how they would use breathing, "holding on," and S.T.O.P. to help them remain calm in survival type situation.

Option: whole group or small group closure can be done orally.

R8

SURVIVAL SIMULATION

Focus To provide an opportunity for students to apply knowledge of priorities of life in a simulated outdoor survival situation.

Group Size 10-16 students

Time Required 2.5 hours

Materials Journal or drawing paper
Clipboard
Pencil
Handout: ***Will You Survive?***

Physical Setting Area west of Yellowjacket Ponds *(Ponds are on north side of Yellowjacket Creek)*

Process

1. Students and teacher review priorities of life (oxygen, safety/freedom from injury, shelter to preserve body heat, water, food)

2. Students and teacher review group and trail procedures.

3. Group hikes approximately 1.0 mile to simulation area following the creek trail east to the bridge over Yellowjacket Creek. After crossing the bridge, the group walks through the park to the forested area west of the ponds. Students or instructor may identify materials (natural or of human origin) that have a potential application to surviving in an emergency situation.

4. Upon arrival, teacher distributes handout and reviews simulation tasks and procedures. Students are paired with a partner for the activity. The area limits for the activity are defined for the students.

5. The task situation: Pairs of students are "lost" in this location. They may have to survive through one or two nights in this environment. It will be dark in one to two hours. There is a high probability of rain and the overnight temperatures may dip into the low forties. They are dressed in the clothes they are wearing for this activity period.

6. Student pairs survey area and identify a location for a shelter which will meet criteria for keeping them dry and out of the wind. They will identify and list rationale for choosing their site. They will sketch plans for improvements which will increase the

effectiveness of their shelter site, including use of any raw materials available in the immediate area. The amount of energy and time needed for the accomplish the improvements are listed. (Time allocated for this task should be approximately 20 to 30 minutes). The student pair will prepare to "share" their site with the rest of the group.

7. The teacher monitors and charts the shelter location for each pair. Assistance may be provided to students in form of questions designed to help them evaluate their site and process.

8. The teacher signals the group to reassemble.

9. The group walks to each shelter site. Each pair makes a short presentation about their site, including possible improvements and time/energy required to make it effective. The teacher or other students may ask questions or offer suggestions and feedback to the presenting pair. The pair will evaluate their shelter plan as to its effectiveness in keeping them warm, dry and its potential that they would survive in a real situation comparable to that in the simulation..

Will You Survive?

You and your partner are lost in this location. It will be dark in one to two hours. The overnight temperatures may dip into the lower forties and there is a high probability of showers. Using your knowledge of the priorities of life, work with your partner on the following tasks. Remember, your ability to think, cooperate, and use the knowledge that you have are the keys to surviving in this type of situation.

TASK #1: Survey the area within the limits established by your teacher. Look at all potential sites for a shelter which will keep you dry, out of the wind, and help you maintain your body heat. Pick a site for your shelter. List the reasons you and your partner picked this site.

TASK #2: Brainstorm with your partner possible improvements you can make to your site using any raw materials available in the immediate area. Sketch what your shelter would look like if you made the improvements. (DO NOT CONSTRUCT A SHELTER OR DISTURB ANY MATERIAL IN THE AREA).
Identify and list how much time, energy and effort will be
needed to make the improvements you have in mind for your shelter.

TASK #3: With the help of your partner, prepare to tell the whole group about your shelter. Share your shelter with the group and answer their questions.

TASK #4: Participate with the whole group in listening to the presentations by the other pairs. Ask questions you have about their site and plan. Make any comments and suggestions you feel would help them.

TASK #5: Evaluate how well you and your partner were able to cooperate and solve problems together.

TASK #6: Based on your knowledge of the situation, your simulated shelter, and the quality of your teamwork with your partner, rate your chances of surviving in the situation presented in this activity.

1 = No chance! We're goners.
2 = Its possible but we are at risk.
3 = We're winners. We'll make it!

Make It Last

BRADSTON: CITY IN NEED

Focus Through a role playing and simulation game, students are better able to understand the advantages and disadvantages to two approaches to managing water resources--the "hard path" and the "soft path".

Group Size 30 students

Time Required 2 hours

Materials *Presentation Materials (suggestions)*:

Flipcharts	Markers
Overhead projector	Poster board
Overhead sheets	Chalkboard
Chalk	etc.

Handouts:
Bradston: City in Need of Water
City Council Information
Special Interest Group Information

Physical Setting Standard classroom

Process 1. Using the following statistics, ask students to brainstorm methods (ways) to manage our water resources (list on chalkboard, overhead or poster):

The availability of adequate water resources will be the most serious long-range problem confronting the United States and the world.

Gerald D. Seinwill
Former Director, U.S.
Water Resources Council

- At least 80 countries, accounting for nearly 40 % of the world's population, now experience serious droughts.
- World population increases by 212,000 each day.
- The World Health Organization estimates that 25 million people die every year from cholera, dysentery, diarrhea, and other diseases caused by unclean or inadequate water--an average of 68,500 deaths each day.

•In 1979, the U.S. Water Resources Council projected that by 2000 only 3 of the 21 federally designated water regions--New England, the Ohio basin, and the South Atlantic-Gulf area--will have ample water supplies.

2. Using the definitions below, have students categorize each item on their list as being a "hard path" or "soft path" method for managing water resource:

Hard Path: Favors increasing water resources in an area by building large-scale dams, creating reservoirs, and constructing canals to transfer water from one watershed to another.
*(**major disadvantage** is the expense and disruption of the environment)*

Soft Path: Favors voluntary and mandatory water conservation programs along with price increases to reflect the true costs of using water for irrigation and for industrial, commercial, and domestic purposes.
*(**major disadvantage** is it involves the cooperation of many different groups, and it goes against archaic water laws that state landowners adjacent to water must continue to withdraw the same amount of water each year to maintain their right. "Use it or loose it.")*

3. Explain that to understand the "hard path" and "soft path" options, the students will be participating in a role-playing and simulation game.

4. Read ***Bradston: City in need of Water*** with the students.

5. Divide students into groups: one group representing the Bradston City Council and the other groups representing each special interest option.

6. Give ***City Council Information*** to the council and ***Special Interest Information*** to the other groups. Allow work time, then call all the groups together for the Bradston City Council meeting. Debrief as needed.

Background Information:
Bradston--The City in need of Water

The population of Bradston is 250,000 and rapidly increasing. The city's boundaries are being extended but the suburban fringe is expanding even more rapidly. The rapid population growth is accompanied by demands for more water for both domestic and industrial uses.

The current water resource management system was built in the early 1970's when the population of Bradston was 75,000. The system consists of a water filtration plant that draws water from the Petekat Lake Reservoir. The reservoir is created by a dam on the Greytab River which is a tributary stream of the Roe River. The water filtration plant provides 75% of Bradston's water needs, and the hydroelectricity generated from the dam coupled with a coal burning plant located in the city provide Bradston with energy.

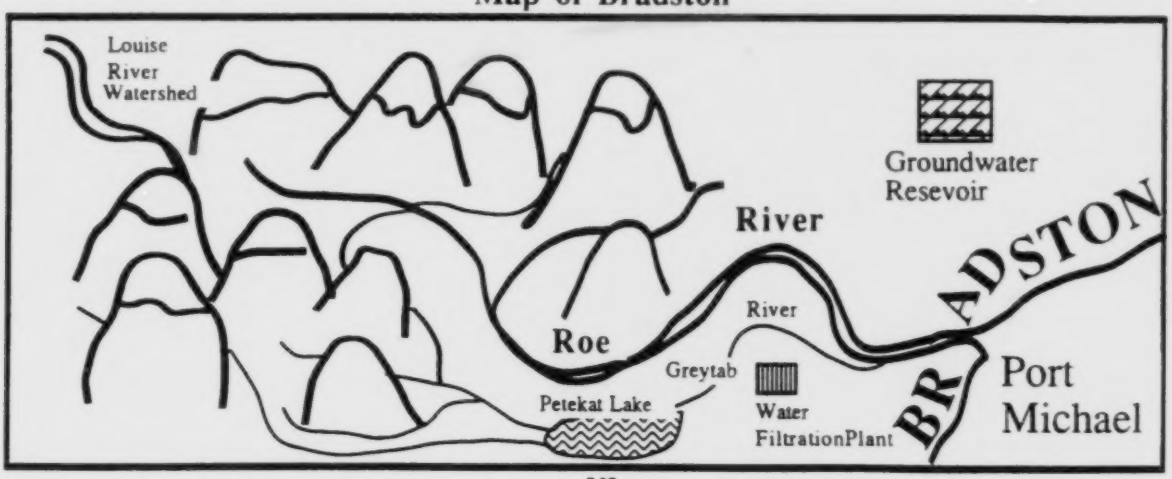
The other 25% of Bradston's water is pumped groundwater. The aquifer that lies underneath the town is recharged by the mountain streams and rivers north of the town. Limestone is the predominant rock strata in the aquifer.

Bradston's economy is based on the industry along the waterfront of Port Michael, a narrow sound that extends to the ocean, and the light industry that has developed in and around the city. The citizens of Bradston have a strong sense of the natural environment. Hiking, river rafting, and fishing in the scenic Roe River Watershed is a common experience.

Knowing that the city's water supply is tapped out, the City Council of Bradston is holding a public hearing on proposals to increase Bradston's water supply. The 7 special interest group proposals are as follows:

1. Dam the Roe River to create another water reservoir and produce more hydroelectricity
2. Channelization of the streams and creeks feeding Petekat Lake
3. A water diversion project which would take water from the bordering Louise River Watershed and bring it to the city of Bradston
4. Increase the amount of groundwater being withdrawn from the aquifer
5. Build a desalination plant on Port Michael to convert salt water to fresh
6. Tow icebergs from the Antarctic region
7. Increase the amount of rain by controlling the weather through a cloud seeding program

Map of Bradston



Y3

Methods for Managing Water Resources: City Council Information

City Council Task:

1. Hold a City Council meeting for all special interest groups proposing a solution to Bradston's water supply problem.
2. Create questions for each special interest group that highlights the disadvantages of their proposal based on the information below.
3. Develop criteria to evaluate the proposals and select one.

Method	Disadvantages
Dam the Roe River	A large area of land behind the dam would be permanently destroyed by the dam's reservoir. The scenic natural area is currently being used for hiking, fishing, and river rafting. Some people living in the area, some vacation cabins would have to be displaced (moved), and some wildlife habitats would no longer exist.
Channelization of streams and creeks (tributaries) flowing into Petekat Lake	The channelization project would create a greater flood hazard. It would also increase sediment deposits and erode banks downstream from Petekat Lake. Channelization would also destroy the salmon spawning grounds and wetland plant habitat. Some people in Bradston claim that taking the meandering scenic streams and creeks and straightening them upsets the beauty of the area.
Water Diversion from the Louise River Watershed	The cost of diverting water from the neighboring Louise River Watershed would be enormous. Estimates for the main canal run between $20-40 billion dollars. The price could easily double when including the distribution canals. Almost 1/4 of the diverted water would be lost through evaporation.
Groundwater Use	Heavier reliance on groundwater would create three problems for the city of Bradston: one, eventually the aquifer would be depleted because water would start to be drawn faster than precipitation could recharge it; two, because of the limestone rocks around Bradston, sinkholes would become a hazard; three, the saltwater from Port Michael would begin to intrude into the freshwater aquifer.

Method	Disadvantages
Desalination Plant	The energy requirements for a desalination plant would tap the energy resources available to Bradston. This would mean that no new industry could move into Bradston. Water from the desalination plant would cost 6 times as much per volume as water from the filtration plant. Desalination would also create huge piles of salt that would need to be disposed of.
Towing Icebergs	The technology for towing an iceberg has not been perfected. Some of the questions that still need to be answered include: 1. How to lasso and tow such a large object 2. What % of the iceberg would melt during the trip (it is estimated that a fleet of tugboats would need a year to tow an iceberg) 3. What effect would the iceberg have on local weather. Would fog and rain be created? Would it be harmful to marine life? 4. Who owns the icebergs in the Antarctic? 5. What are the hazards to shipping if parts of the iceberg break off during towing?
Controlling the Weather	Cloud seeding is still in the experimental stage. It has been successfully done, but scientists are unclear if total rainfall is actually increasing, or rain is being shifted from one area to another. Cloud seeding could change weather patterns, and can actually reduce rainfall if seeding is done incorrectly. The effect on the ecology is also unknown, including the possible harm silver iodide has on humans and wildlife.
Water Conservation Campaign & Laws	Educational campaigns cost money. Laws don't cost money to make, but they cost money to enforce. The City Council does not have the extra money available to implement the changes without raising taxes. Citizens are usually resistant to an increase in taxes and might be just as resistant to mandatory water use laws, such as the proposed "no watering lawns," during the summer.

Methods for Managing Water Resources: Special Interest Information

Special Interest Group Task:
1. Develop a 3 minute presentation that highlights the advantages and explains your proposal for managing Bradston's water resources.

2. Develop a list of the possible disadvantages of your proposal and be prepared to answer questions about the disadvantages.

Method	Advantages
Dam the Roe River	Building a hydroelectric dam on the Roe River offers many benefits. First, the local economy would be boosted by the construction and maintenance of the dam. Second, the flood danger of the Roe River would be reduced to almost nothing. Third, the dam's reservoir would provide for the popular recreational activities of water skiing, jet skiing, and boating. Finally, the additional hydroelectricity available in Bradston would attract more businesses into the area.
Channelization of streams and creeks (tributaries) flowing into Petekat Lake	Channelization is taking a natural stream channel and straightening, deepening or widening it. This engineering technique would increase the amount of water flow into Petekat Lake, which is where the filtration plant draws its water. The channelization project will lead to better flood control in the channelled area, and it will have minimal impact on the scenic Roe River natural area. Cost for the project would be in the middle when compared to the other proposals.
Water Diversion from the Louise River Watershed	The water diversion project consists of transporting water from the Louise River Watershed to the Roe river via a giant pipe-line. This project would keep all of the Roe River Watershed intact, keeping it unchanged for people to enjoy and preserving it as wildlife habitat. It would also take water from an unpopulated area where it is not needed and brings it to a populated area where it is needed.

Method	Advantages
Groundwater Use	Utilizing more of the existing groundwater resources is the least expensive option because all the equipment to accomplish this is already built and operating. The project would not increase the cost of water to domestic and industrial users in anyway, and it would not destroy any wildlife or scenic areas. Depending more on groundwater would also heighten the awareness of pollution in Bradston. People would be more concerned about contaminating the groundwater with pollutants from agricultural lands, feedlots, septic tanks, landfills, household hazardous waste and industrial chemicals.
Desalination Plant	Desalination is the process of removing salt from ocean water. Two methods work: *distillation* uses energy to evaporate fresh water from saltwater; *reverse osmosis*, separates saltwater and fresh water utilizing a semipermeable membrane, which allows the flow of water but no salts. A desalination plant would add jobs to the Bradston economy and would not change the existing scenic and natural areas of the Roe River Watershed.
Towing Icebergs	Towing icebergs from the Antarctic region would utilize an untapped natural resource in an unpopulated area, and preserve scarce natural resources in a populated area. Antarctic icebergs are flat and wide sheets of ice that potentially could supply five times the world's current domestic water use. This project would also develop new scientific and marine transportation techniques as towing icebergs has never been done.
Controlling the Weather	Twenty-three states since 1977 have successfully seeded clouds. Two methods are currently being used to seed clouds with a powdered chemical that acts as nuclei for small water droplets: one involves flying a plane over or under the cloud; the other involves injecting the cloud from ground-mounted burners. The following have been used for cloud seeding: silver iodide(the most effective), salt crystals, dry ice, and clay particles Cost of cloud seeding would be minimal compared to the other projects.
Water Conservation Campaign & Laws	To decrease the amount of water being used in Bradston, a group of citizens is proposing to educate citizens on how to conserve water, and it wants the City Council to pass water use laws. The education will take place in the schools, at street fairs and libraries, through public service announcements in the paper and on TV . Books and pamphlets will be published. Some of the proposed water laws include: rationed summer lawn watering, mandatory low flush toilet and low flow shower heads.

ENDANGERED SPECIES: Whose Fault?

Focus To use guided inquiry and specimen examination to discover causes for selected animal species having become threatened or endangered.

Group Size 20 (*40 if Wildlife and Water Resources rooms used simultaneously*)

Time Required 30-40 minutes

Materials
Pen/Pencil
Notebook/writing surface
Handout: ***Endangered Species: Whose Fault?***

Physical Setting
Wildlife Room
Water Resources Room
Cispus Administration Office

Process

Activity 1: ENDANGERED SPECIES: WHOSE FAULT?

1. Walk through the Cispus Administration Office, and examine the Spotted Owl mounted in the showcase.
2. Then, go to the Wildlife Room and Water Resource Room (located in the Education Building). Examine the mounted birds and mammals, the fur pelts, skins, shells and skulls. Inform your students that Cispus acquired these specimens from state and federal agencies responsible for enforcing animal protection laws.
3. Have students respond to questions on the worksheet **Endangered Species: Whose Fault?**. More may be gained by encouraging students to work in group.
4. Complete the activity through whole group discussion. Be prepared, not all may agree about "preserving" a species at the expense of people's jobs.
5. Emphasize in discussion habitat management, regulation by law, and international agreements, as most effective way to save endangered or threatened species.

Extension
Watch the following films in the Cispus Video Library:
"Sea Turtles" (60 min)
"The Lorax" (24 min)
"Rage Over Trees" (50 min)
"Future of Wildlife" (15 min)

ENDANGERED SPECIES: WHOSE FAULT?

1. What does "endangered species" mean? Define it in your own words. What does "extinct" mean?

2. List the names of endangered species specimens found in Cispus displays.

3. How did Cispus acquire these specimens?

4. What has happened to the people who originally killed or had possession of these specimens?

5. Did these individuals know about laws concerning these animals?

6. What motivated these individuals to break the law?

7. What were the expected uses for these animal's remains?

8. What are other indirect causes for the near extinction of other animals?

9. Name other animals not shown here whose species survival is threatened or endangered?

10. List things that you, as a concerned citizen, can do to help endangered species survival.

11. What do the government and police agencies do to help endangered species survival?

12. What can private, non-profit organizations do to help endangered species' survival?

FOCUS ON FREEDOM

Focus To show the possibilities and opportunities for living an alternative, self-sufficient lifestyle outside the confines of a high consumption society. The need for management of recycling from the beginning will be explored. This lesson will also explore a new meaning for freedom.

Group Size Entire Class (12-30 students)

Time Required 2.5 Hours

Materials Human Resource - Bruce Haney, Environmentalist (***Be sure to arrange, through Cispus Staff, in advance for Mr. Haney's presentation.***)
3-6 sheets large newsprint
3-6 markers
Masking tape
For each student:

1 penny	1 small block of cedar
1 small square of animal fur	1 grain of corn
Field journal	Pen/pencil

Physical Setting Standard Classroom
Bruce Haney's Property

Process **Activity 1: IN THE CLASSROOM**

1. Give each student 1 penny, 1 square of fur, 1 kernel of corn, and 1 small block of cedar.

2. Tell the students that these items represent:
penny - financial resources (money)
fur - livestock (i.e. goats, sheep, cattle)
corn - plants, vegetables, and grains from plants
cedar - trees (timber resource, etc.)

3. Divide the students into groups of 4 to 6, and ask them to brainstorm ways of using their resources in the Cispus environment to provide the life essentials of food, clothing and shelter. A scribe in each group will use a marker to list these ideas on the sheet(s) of newsprint (10 minutes.)

4. Call groups together to take turns sharing the ideas (1 speaker from each group) they've written down. Hang newsprint up on the classroom walls.

5. Facilitator (teacher) may facilitate additional discussion.

Activity 2: IN THE FIELD

1. Class will walk to Mr. Haney's property (approx. 1.5 miles, 20-30 minutes).

2. Mr. Haney will share the aspects of living with minimal expenditure of financial resources (money).

3. Mr. Haney will also share his ideas about maximizing the use of all natural resources to create a comfortable lifestyle.

4. The students will take field notes of their observations.

Activity 3: IN THE JOURNAL

1. The students will journal 10 ways in which they can maximize the usage of resources which they are currently using.

Extension Activity 1:

1. The students will (in a classroom setting) divide into groups of 4 to 6 and discuss again the possibility of uses for: *penny, fur, grain, and wood.*

2. The students will report, in writing, how thorough use and reuse of resources can reduce consumption of natural and commercial goods and preserve financial resources.

Extension Activity 2:

1. Divide the class into 4 groups and make each group responsible for 1 of the resources. Each group may create as many commodities from their resource type as they wish. These should be listed on a large sheet of newsprint.

2. The groups may barter their resource commodities in trade for resource commodities from other groups (20 minutes).

3. The groups need to provide food, shelter, and clothing for their community group from these commodities.

5. There are no stores.

6. Allow each group 20 additional minutes to create their community.

7. Allow each group to share about their community and its resources (20 minutes).
In consideration of item #4, how did the group in control of financial resources fare in building their community? Discuss.

FORESTERS LOG TREES, RIGHT?

Focus To acquaint students with the work of foresters through guided inquiry, cooperative learning, and film.

Group Size Entire class

Time Required 40 minutes

Materials Pen, pencil and writing surface
Increment boreR
Measuring tape
Film: "*What Exactly Does A Forester Do?*" (*65 minutes*)

Physical Setting Forestry Room (*in the Education Building*)

Process

Activity 1: FORESTERS LOG TREES, RIGHT?

1. Get an increment borer and measuring tape from the Cispus Supply room. Set up the VCR, and have the tape ready to go.
2. Take your students into the Forestry Room and allow them time to examine displays.
3. Brainstorm: use the title of the film as a starting point. Show the increment borer and the measuring tape. Ask them what other tools a forester might use and mention there's a question about it later.
4. Discuss, "bias", the film is a production of the Washington Forest Protection Association, a public relations arm of logging companies.
5. Show the film. It has a lot of humor built in to hold everyone's attention. Then, immediately rewind the film to show again at the end of the activity.
6. Pass out the activity worksheet, **"Foresters Log Trees, Right?"**
7. Separate your students into groups to work cooperatively.
8. When it looks like everyone is done, go over the questions orally, then ask, "Do you want to see it again?"
9. Show the film again; they may like the humor, but they'll also learn something they missed before.

Extensions:
1. Discuss being a forester: the advantages, disadvantages, and educational requirements.
2. Watch films that show another bias and call for a different kind of balance in making management decisions

Foresters Log Trees, Right?

1 . Are foresters loggers?

2. What must a forester consider in balancing management decisions concerning private and public lands?

3. Why must a forester working for a private company on privately owned land be concerned about the public needs on private, state, or federal lands of adjacent properties?

4. How was the chainsaw mishandled?

5. What tools do foresters use to do their jobs? (Name at least 4.)
1. _____ 2. _____
3. _____ 4. _____
5. _____

6. What kinds of groups are consulted before making management decisions on federal lands? (Name at least 3.)
1. _____ 2. _____ 3._____

7. How many seedlings had to be planted, on private logging company land, to replace losses from the Mt. St. Helens eruption ?

8. How did the forester for the Tulalip Indian Tribe make a decision on management of tribal forest lands?

9. Name other professionals consulted when making management decisions on federal forest lands? (Name at least 4.)
1. 2.
3. 4.

10. What was the goal stated in managing forest land for timber production?

FUTURE OF WILDLIFE

Focus To use guided inquiry and film in understanding the causes of threats to wildlife survival, the history of management, and future challenges.

Group Size Entire class

Time Required 1 hour

Materials
Pen/pencil
Writing surface
Film: *"FUTURE OF WILDLIFE" (15 min).*
Handout: ***Future of Wildlife***

Physical Setting Any large classroom in Cispus Education Building. Smaller Wildlife and Water Resources rooms can be used for examination before or after worksheet activity.

Process

Activity 1: FUTURE OF WILDLIFE

1. Arrange seating and VCR in a large classroom

2. Discuss the meanings of the following terms prior to watching the film. There are dictionaries and resource books in the Cispus library for your reference.

habitat	carrying capacity	wetlands
pesticides	non-game species	herbicides
revenue	urban sprawl	extinct
exploit		

3. Show the film, then take your group to look at the displays in the Wildlife and Water Resources rooms .

4. When you return to the large classroom pass out the activity worksheet, ***Future of Wildlife***. Allow time for your group to complete the worksheet and compare answers. Then, disucuss the class responses.

FUTURE OF WILDLIFE

1. How has wildlife benefitted human welfare? (List 2 ways.)
   1.
   2.

2. Name several animal species that have been exploited to the point of extinction, or near extinction by our use or abuse.
   1. _____ 2. _____ 3. _____

3. What two things have caused the extinction of certain species and serious population declines in others during the past century?
   1.
   2.

4. Why was there little concern, until recently, for these situations?

5. Pressures of civilization have caused serious declines in many animals' populations. Give at least 8 specific causes of this decline. (the film lists 12)
   1. 5.
   2. 6.
   3. 7.
   4. 8.

6. When our government (state and federal) became involved in managing wildlife, the cost wasn't cheap. How does the government pay for management?

7. What 2 forms has this management taken?
   1.
   2.

8. Explain the problem of multiple agencies being involved in managing the same area of land.

9. What is the single most important element in successful wildlife management?

10. Name 5 animals whose careful management and protection has caused their populations to grow again.

1. _____ 2. _____ 3. _____
4. _____ 5. _____ 6. _____

11. Give the names of at least 5 non-game species of animals.

1. _____ 2. _____ 3. _____
4. _____ 5. _____ 6. _____

12. Why is it necessary to manage or allow for non-game animals?

13. What has been the problem for wildlife in replanted clear-cuts?

14. What are at least 3 of the values of managing habitat for the animals' sake?

1.
2.
3.

15. "There is no wasteland...." Comment on the meaning of this statement from the movie.

16. "People use," seems to be at the root of many animal species' problems. Does that mean we just stay away and stop building and...?
Write a paragraph explaining how to overcome most of the problems. (Remember, there are no easy answers.)

NO POWER? NO PROBLEM.

Focus The focus of this lesson is to consider our interdependence on electricity and to explore the lifestyle alternative of living in a home externally supplied electricity.

Group Size 12-30 students

Time Required 2.5 hours

Materials

3-6 sheets of newsprint	*Per student:*
3-6 markers	Field journal
Masking tape	Pen/pencil

Transportation for group
Human resource: Rory Vance (***Be sure to arrange, through Cispus staff, in advance for Mr. Vance's presentation.***)

Physical Setting Standard Classroom
Rory Vance's Property

Process

Activity 1: IN THE CLASSROOM

1. Divide class into groups of 4 to 6 people.
2. Give each group a marker and a large sheet of newsprint.
3. Ask each group to brainstorm for 5 to 10 minutes ways in which electricity had impacted their lives in the past 2 days.
4. Bring class together and have each group share their ideas and hang newsprint on the wall.
5. Introduce Rory Vance who will discuss the practicality of living without electricity.

Activity 2: IN THE FIELD

1. Students will ride to Rory Vance's property where Mr. Vance will share his home and lifestyle, which is independent from outside sources of electricity.
2. Students will take field notes of their observations.

Activity 3: IN THE JOURNAL

1. The students will journal three ways which they could limit or eliminate the use of electricity in their daily lives.

STOMPED TO DEATH

Focus To illustrate the effects of foot traffic in forested areas of the wilderness.

Group Size Entire class (12 to 30 students)

Time Required 1.5-2 hours

Materials
Field journal and pen/pencil (*per student*)
50 cm. x 30 cm. x 10 cm. pan or foil lined box
10 liters of soil *(available from soil pit beyond trailer #10)*
2 - #10 cans with both ends removed
Stopwatch
3 pitchers of water (*1.0 liter in each*)

Physical Setting
Forestry room
Outdoor (*undisturbed forested area, abandoned trail, pond trail*)

Process

Activity 1: IN THE CLASSROOM

1. Fill the pan or foil lined box with water and stand #10 cans loosely on top.

2. Loosely fill 1 - #10 can half full with soil.

3.Fill the other #10 can half full with soil, pressing down as you fill.

4. Pour 1 liter of water into both cans simultaneously.

5. Note which can of soil allows the water to flow through most quickly. Students will note their observations in their journal.

6. Refill two pitchers for outdoor activity.

Activity 2: IN THE FIELD

(Students should note all observations in their field journal.)

1. Walk students to undisturbed forested area across road from Elderberry dorm. Keep students on road while pushing 1 - #10 can 5-10 cm. down into the soil. One student should hold can firmly down into the soil. Pour 1 liter of water into the can and note length of time (using stopwatch) it takes to drain.

2. Walk students to abandoned trail (across from Elderberry dorm) and repeat process with #10 can, water, and stopwatch.

3. While at this location note to students that "This trail was abandoned in 1976." Note how this trail has still not returned to its original state, although it has not been actively used in over 13 years.

4. Walk students to the "Ponds Trail" (southeast of gym) and proceed down trail several hundred meters. Repeat process with #10 can, water, and stopwatch in the middle of this actively used trail.

5. Note to students the number of uprooted trees down in this area. Students may notice the curled or "balled" effect of the roots on these uprooted trees. This is primarily due to a fungal infection (phellinus) of the roots cause by a lack of water. Water has been inhibited from getting to the roots due to compacting caused by high foot traffic.

6. Walk students back to area between dining hall, Sasquatch Lodge, and amphitheater behind the classroom building. Note to students the fences which have been erected to eliminate foot traffic. The soil inside the fences has been tilled and reforestation attempts are being made by importing nurse logs, small trees, and shrubs. This is an attempt to save the large Douglas Fir trees located in this area.

Activity 3: IN THE JOURNAL

1. Return to classroom to discus observations & conclusions.

2. Students will journal a report of their observations and discuss why it is important to stay on trails in forested areas.

Threads In The Web

BIRDS OF A FEATHER

Focus To understand how feathers are unique adaptations which allow birds to thrive in their various habitats.

Group Size Small group to entire class

Time Required 20 minutes

Materials
A variety of feathers with different colors and shapes
A variety of study skins, as well as some individual wings
Hand lens (*1 per student*)
Small water bottle and dropper
Feather diagram

Physical Setting Wildlife room, with study skins .

Process

1. Hand-out a feather to each student, examine with a hand lens looking for shaft, barbs, and barbules. Use the diagram.

2. Discuss the attributes of each part. The shaft provides stability and is made of chitin. Barbs are hooked together by small hooks called barbules. Use a hand lens to see these and gently pull apart. Smoothing these tiny hooks together show how birds realign their feathers and preen to remain dry.

3. Place a droplet of water on the surface of the feather. Observe what happens. (It stays as a droplet, because of natural oil on the feather which the bird applies with its beak from an oil gland under the tail feathers.)

4. Compare the shapes of individual feathers. Primary flight feathers usually have more barbs on one side than the other and it should be obvious which side of the bird the feather came from. Tail feathers are more equally rounded each side. Contour feathers provide shape and downy feathers provide warmth. Have students guess the number of feathers on various birds - Hummingbirds (1500), Robins (3000), Swans (25,000) Show and discuss wings - and how feathers contribute to general aerodynamic shape. Compare to airplane wings.

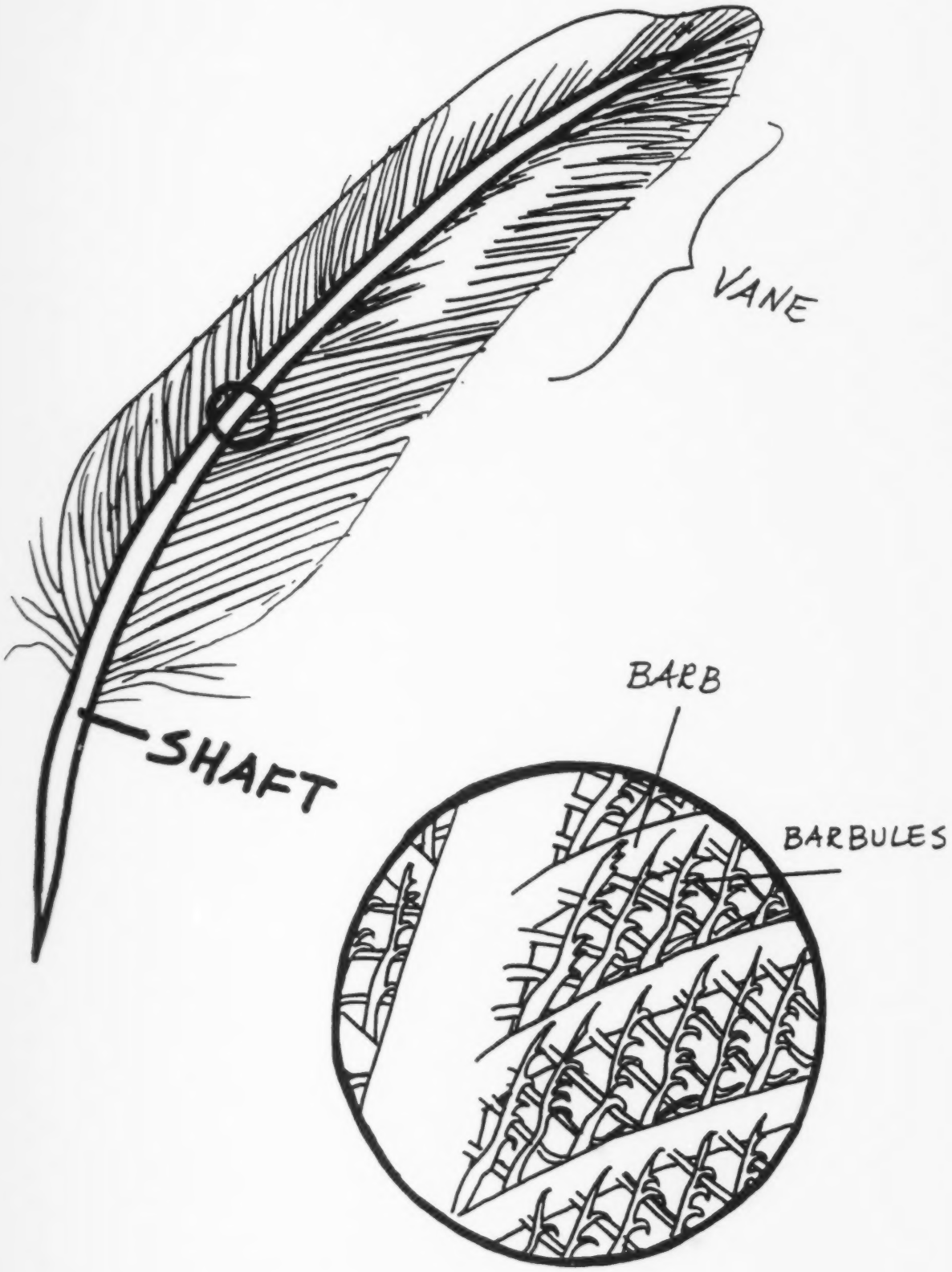
5. Compare coloration of feathers. Discuss the adaptive needs for camouflage, flashy coloration for courtship, and color changes between mating and nesting seasons.

6. Show study skins - Be gentle since they are fragile

Extensions: Sketching feather after close observation

Background:
Birds are the only animals which have feathers and it makes them unique. Some things feathers do for birds include:
keeping them warm
providing them shape
increasing surface area for flight
providing color for courtship.
Feathers evolved 140 million years ago.

G1


VANE
SHAFT
BARB
BARBULES

CRITTER COPING

Focus To understand how some animals cope/adapt to different environments, by examining their prints, pelts, skins, feathers, skeletons, and coloring.

Group Size 20 maximum

Time Required 1 hour, with discussion/review

Materials Pen/pencil
Notebook/writing surface
Handout: ***Critter Coping***

Physical Setting Wildlife and Water Resource Rooms

Process

Activity 1: CRITTER COPING

1. Take your group to examine the Cispus Wildlife and Water Resources Rooms located in the Education Building.
*Many exhibits are designed for handling or touching--just caution students to be careful not to drop or damage displays. No souvenirs may be taken from these rooms. Some items are on loan from federal agencies.

2. After about 5 minutes of excited observations, get your student's attention focused on the ***Critter Coping*** activity. You may want to separate students into smaller groups to work on the questions.

3. Review through larger group discussion when it seems most groups have completed the activity.

CRITTER COPING

Webster's Dictionary defines "coping" as: fighting or contending with successfully or on equal terms. "Adapt", is defined as: to adjust oneself to new or changed circumstances.

1. What does wildlife have to fight or contend with--not considering humans and their impact?

2. In what ways do humans affect wildlife survival? What coping techniques do some varieties of wildlife use to cope with, or against, humans?

3. Based on what you know and after looking at the fur pelts on the wall, how do these mammals...

cope with the cold of winter? (List two ways)

cope with hot summer weather?

4. After examining the pelts and identifying the original owners, which animals do you think spend a lot of their time in the water? Why do you think that?

5. What do some of the fur bearing, plant eating animals do to get them safely through the coldest part of winter?

6. Identify the skulls from meat-eating (carnivorous) animals? How can you tell?

7. In comparing carnivores to plant-eaters (herbivores), what changes do you note in their skull structure?

8. How do some birds and mammals hide from those animals who prey on them?

9. How are birds that rely on speed and maneuverability to capture their prey different from seed and insect eating birds?

10. Birds of prey have no hands to hold their food, how do they do it?

11. Which birds of prey hunt primarily at night and rely on their sense of hearing a great deal? They have good eyesight also, but it's different from birds that hunt in daylight, how is it different?

12. In what other ways is this bird (q.11) specially adapted to night hunting?

13. How do some birds adapt to live out the winter without migrating? Name some. Which animals adapt to winter without hibernating?

14. Examine the sample paws and paw prints and print casts shown in the Wildlife Room.
Which mammals spend a good deal of their time in the water? How can you tell?

Which animals might use their feet to dig through snow to find food? How do you know?

Which animals might climb a tree? How can this be determined?

Name the mammals that rely on their paws to manipulate food. How is this shown, based on observation of mounted samples and paw prints?

15. If a bird cannot cope with changing seasons, what is it forced to do?

16. Why is the male of most bird species much more brightly colored than the female? Why is the female coloring usually so plain in comparison?

17. What part of coping and adapting of animals do you find most interesting and why?

EVERYBODY'S GOTTA EAT

Focus To help students understand the dynamic nature of food chains and interdependence of living organisms.

Group Size Entire class (fewer will work, minimum of 15)

Time Required 30-45 minutes

Materials Large bag of popped popcorn, fir cones (*would be more environmentally sound*), or fir needles
Small, plastic sandwich bags (*one per student*)
Identifying tags (*3 colors, paper or material*)

Physical Setting This activity is best done outdoors in a flat, grassy area, or inside if necessary on a spacious, uncarpeted floor as in a gym. An area 20' X 20' will work, depending on numbers of participants. The area should be marked off with rope, traffic cones, masking tape for floors, etc. --whatever is handy.

Process 1. Discuss the concepts of food chains and interdependence. Have students brainstorm animals and insects that might live in the Cispus area. Cispus Guides to Mammals and Birding might be helpful, but try using reasonable suggestions from students. Next ask students to suggest predator-prey relationships or links in a food chain from their lists of animals and insects. Rotted Wood--Insect--Sparrow--Hawk or Microorganism--Water Insect--Trout--Fisherman are examples, let the group think up their own ideas.

2. Spread out popcorn/fir cones/piles of needles within the marked-off area. This is the food for, let's say, the stonefly larvae, which would be eaten by trout, which might be caught by an angler. Each of three different colored tags (these can be held or attached in some manner to clothing or arms) are given to approximately a third of the students, so that one third might become stonefly larvae, one third trout, and the remaining third anglers. Practice with the students by calling, "Orange!" and have the orange group respond "trout!" so that each group knows what they are and what they will eat.

3. Each student will have a bag that has been marked at approximately one-fourth the available volume. Permanent markers will work well for either plastic or paper bags. Stonefly larvae, when allowed to begin to eat, must fill their bags to the one fourth level in order to survive. Trout, when allowed to move into the game area to eat, must tag the stonefly larvae, thereby "eating them." When they are tagged they must give the contents of their bag to the trout. Trout must fill their bags to the half full level in order to survive. When anglers are allowed into the "eating area" they will tag only the trout, whereupon the trout must surrender the contents of their bags to the anglers. Anglers would probably survive without any trout, as they could simply stop at McDonald's on the way home, or raid the refrigerator!

4. To begin, allow all the creatures to move into the game area at once and begin "eating." In this situation, it will seem as if the game is failing miserably, as it will be likely for all the stonefly nymphs to be eaten up before they have any real chance to forage for food. This will leave some of the trout starving, and probably no anglers with any fish.

5. Vary the conditions of the game by varying the amounts of food available, the numbers of animals that are allowed to eat and the times they are allowed into the game area. Be sure to follow up each trial with discussion of the results (What will happen if the game area size is changed?). Have students make all suggestions to try and change the results.

IN THESE ANCIENT TREES

Focus To understand importance of biodiversity in management decisions for "old growth" and National Forests, and highlight problems from past management practices.

Group Size Entire class

Time Required 1 hour

Materials
Pen/pencil
Writing surface
Film: *"IN THESE ANCIENT TREES" (35 minutes)*
Handout: ***In These Ancient Trees***

Physical Setting Forestry/Logging Room *(for film viewing)*

Process

Activity 1: IN THESE ANCIENT TREES

1. View the film.

2. Discuss the concept of "bias" with the students, and from what viewpoint (bias) this film was made (produced by the National Wildlife Federation).

3. Discuss change in society and technology (as the blacksmith changed with the coming of the car, and full service gas stations are now all virtually self serve).

4. Have your students answer questions on the activity in groups, then discuss responses with the entire class.

Extensions:

1. See the films:
   "The Lorax," (24 min.)
   "Rage Over Trees," (50 min.)
2. Do activity:
   Endangered Species: Whose Fault?

IN THESE ANCIENT TREES

1. What does "old growth" mean?

2. In what two states is the "old growth" controversy centered?
   1. _____ 2. _____
3. According to this report, how much of our nation's old growth forests are already cut?

4. A natural forest has "biodiversity," what does this mean?

5. Assuming "biodiversity" is desirable, because of the relationships between plants and animal, what has been the problem of restoring lands and forests following a clear-cut?

6. Describe the standard clear-cut practice in effect into the early 90's.

7. How is the U.S. Forest Service supposed to manage our forest lands?

8. Some of the controversy in old growth forests centers on the continuing survival of some animals that can only live in that habitat. Name one of these animals.

   _____

9. One tree species that grows in a natural forest is a promising anti-cancer drug. Name this tree.

   _____

10. How was this (answer for # 10) tree treated before the early 90's by logging companies on our federal lands?

11. How are salmon affected by clear cuts? (2 ways)
    1.
    2.
12. Many logging mill workers have lost jobs, not to bans of logging old growth forests, but from WHERE the logs are milled. Explain the problem.

13. In what way can old growth forests be considered a finite, non-renewable resource like oil?

14. In the space below DRAW what a forest would look like with healthy biodiversity.

15. In the space below DRAW what a forest looks like when logging companies have "restored" (replanted) forest lands.

KNOWN CONES :
A KEY TO CONIFERS

Focus To use a simplified dichotomous key to correctly identify local evergreen trees.

Group Size 20-25 students

Time Required 30 minutes

Materials
Diagram or labeled drawing of the parts of a cone
A variety of cones to use to identity cone parts
Sample cones with small pieces of needle bearing twigs
Teacher's information page or field guide to evergreeens.
Handouts:
Conifer Questions
A Key to Conifers

Physical Setting Any outdoor area where evergreens are growing, or indoor classroom.

Process

Ativity 1: THE NAME GAME

1. Use the diagram or drawing to identifier cone bracts, scales, spike, and winged seeds.

2. Identify parts of cones provided or picked up.

3. Discuss or develop vocabulary on key as needed.

Activity 2: UNLOCKING THE KEY

1. Locate tamarack at the bottom of the key.

2. Trace the path of information about tamaracks back to the heading "Green Plants"

Optional:
Generate a list of "yes and no" questions for using the key similar to:

Does this plant reproduce with seeds?
Does it have regular flowers?
Does it have functional leaves and resins?
Are the cone scales well-developed?
Do the cone scales over lap?
When the cone was ripe were the scales persistent, or did

INSTRUCTOR KEY:
Fill-ins for "*A Key to Conifers*"
Abies: True Fir
Pinus: Pine
Picea: Spruce
Tsuga: Hemlock
Pseudotsuga: Douglas fir

it fall apart, leaving only the spike?
Are the needles clustered?
Are the needles evergreen?
Are bracts shorter than the scales?
Are the needles flat?

4. Starting with "Green Plants" work through the key to compare tamaracks with other evergreens.

Activity 3: ALTOGETHER NOW, INSIDE
Distribute sample cones and twigs for a guided group experience of using the key to identify the tree.

Activity 3: ALTOGETHER NOW, OUTSIDE
Meet in a forested area where students can easily find cones of one type and the trees on/from which they grew. Use the key to identify the tree as a spruce, hemlock, or Douglas fir.

Activity 4: KNOWING CISPUS, THE BIG 3
Identify the species.

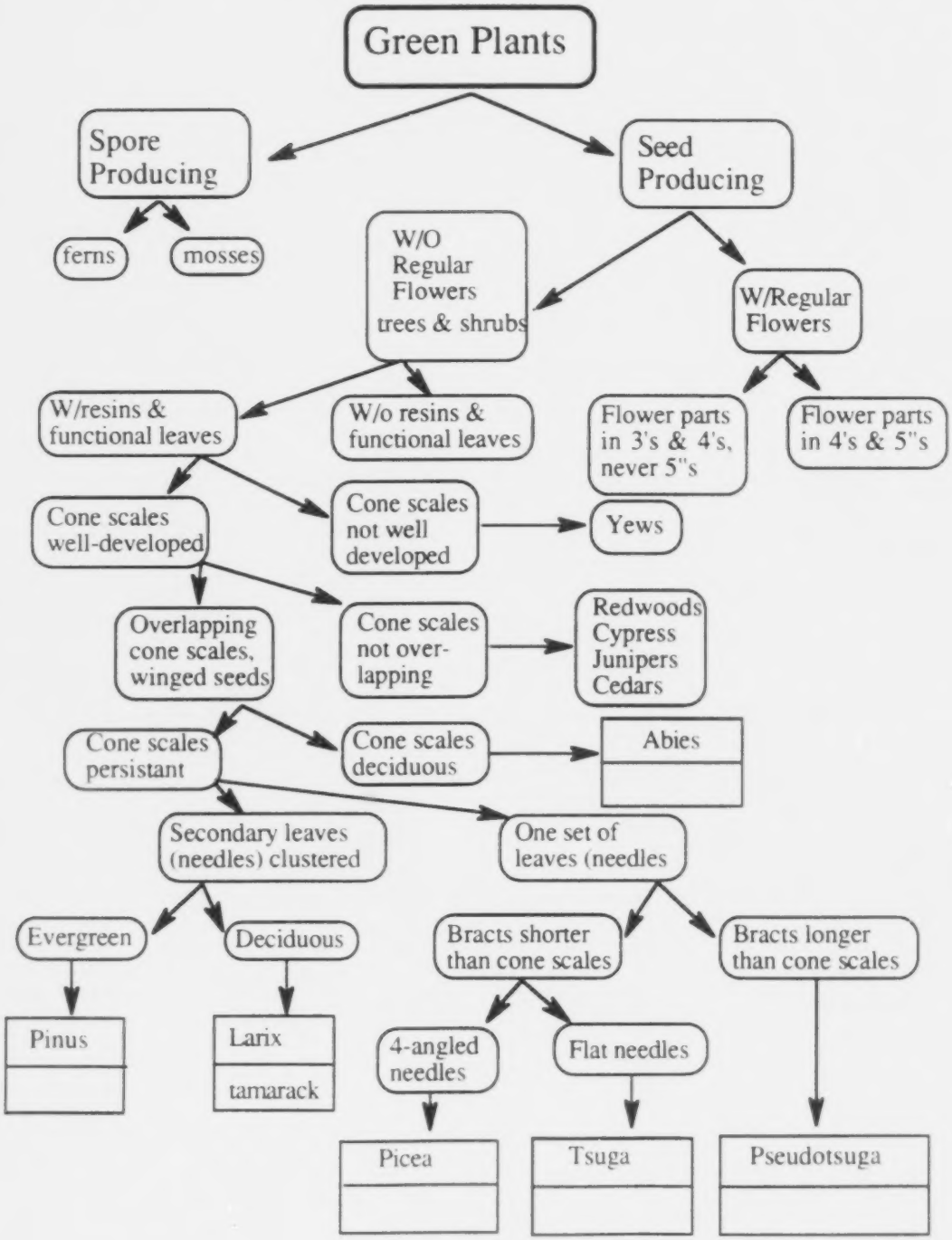
Western Hemlock is shade tolerant and is known for its "flop top."

Sitka Spruce has sharp pointed needles and crackly bark.

Douglas fir has pitchfork shaped cone bracts, thought by some to look like the back feet and tail of small mice, and thick cork-like bark.

A Key to Conifers

Scientific & Common Names



G13

Conifer Questions

1. The Western Larch or _____ is in a "class" by itself. It loses its clustered needles. Its scientific name is _____ occidentalis.

2. A Western Hemlock has a floppy top and short, flat needles. It's scientific name is _____ heterophylla.

3. Western Yellow Pine has needles in groups of three. Its scientific name is _____ ponderosa

4. Noble Fir has tall, showy cones in the summer, but they fall apart in the fall. Its scientific name is _____ procera.

5. Sitka Spruce has rigid 4-sided needles. Its scientific name is _____ Sitchensis.

6. If a pseudonymn is a false name, and only one group of trees has deciduous cones, a Douglas Fir is a false_____ Its scientific name is _____ Menziesii.

Just for Fun:

Common Name:	Scientific Name:
Engelmann's Spruce	_____ Engelmannii
Western White Pine	_____ monticola
Grand Fir	_____ grandis
Lodge Pole Pine	_____ contorta
Mountain Hemlock	_____ Mertendiana

Common Names

what do the common names tell you about the following plants? Why do you think they were given these names?

Devils Club:

Sword Fern/Christmas Fern:

Miner's Lettuce:

Rattlesnake Plantain:

ME AND YOUR SHADOW

Focus To understand how access to direct sunlight and tolerance/intolerance to shade impact a plant community.

Group Size Small group to whole class

Time Required 1 hour

Materials
Paper
Clipboard
Pencil

Physical Setting
Trailer area
Any trail containing stand of Douglas Fir
Playfield

Process

1. Students observe and describe appearance of Douglas Fir trees in various areas of the Cispus campus. The major difference noted should reflect that those in open spaces or on edges have foliage from top to near bottom. Those in stands or in areas cleared in recent years will have foliage only near the top. Note that branches in lower reaches of these trees have no foliage and are dead.

2. Students brainstorm factors that could cause this effect. Water, soil, elevation, temperature, sunlight: which factor(s) accounts for this phenomenon? The factors are evaluated as to possible impact. Conclusion reached that foliage on Douglas Fir survives only in direct sunlight.

3. Teach terms: shade intolerant (plants that cannot live in the shade) and shade tolerant (plants that thrive in the shade).

4. Compare plant communities in a meadow or other open environment with plant communities in a forested (shady) environment. List plants that live in shade and those that live in sunny environment. What will happen to most of the plants on the forest floor if the trees are cut down? Explain.

5. FIND THE MYSTERY TREES THAT WILL TAKE OVER THE FOREST AROUND CISPUS! Identify the small evergreen trees in the forest around Cispus that are growing in the shade (Western Hemlock). Why will these eventually take over the place of the Douglas Fir if nature is allowed to run its course? (The Western Hemlock are readily observed at beginning of lower Covell Creek Trail near the road).

6. How would knowledge of whether a plant is tolerant to shade affect decisions about where to plant it?

7. If you see Douglas Fir trees along a road with foliage only near the top, would this mean that the trees or the road had been there first? Explain.

MOWITSH, SALAL, PISH
Deer, Salal Berry, Fish

Focus To learn how the Indians of the Plateau Region of Washington used the natural environment to satisfy their basic physical need for food.

Group Size Entire class

Time Required 1 .5 hours

Materials
Pencils
Clipboard
Paper (*may be included in a booklet of resource information for students*)
Forest Pharmacy: Medicinal and Edible Plants at Cispus
Handouts:
Indians of the Plateau Region
Cispus Trails sheet

Physical Setting Group may hike the River Trail and stop along the way to locate food sources.
Once at the river, worksheets and artwork may be completed or return to a classroom to do so.

Process
1. Read with the students the" ***Indians of the Plateau Region:***"
2. Discuss the relationship between physical needs and environment (land and water) as sources of food.
3. Identify edible plants, (i.e. roots, berries, greens, trees) along the trail (**CAUTION**: students should be told to neither pick nor taste plants) Handouts for identifying Cispus plants are available in the office.
4. Look for presence of animals (i.e. tracks and sign) along the trail and at the river.
5. Discuss how water can provide a food source. How would the Indians catch the fish in the streams and rivers ?
6. Students may do the worksheets at the river or return to a classroom to do them.

Indians Of The Plateau Region

Topography: Characteristics of the Plateau include an upland plain and a rolling basaltic area from the central to the eastern region. The Columbia-Snake River system flows from the region to the Pacific Ocean.

Climate: Heavy rains alternate with drought; hot summers, cold winters, and periodic high winds in open areas are common in the Plateau Region.

Vegetation: This is mainly grassland, with sparse coniferous and broadleaf forests in the more mountainous areas. Edible berries and root vegetables are often found.

Human beings in all times and places shape their beliefs and behavior in response to the same basic human needs and problems. The choices made by people in adapting to or adapting in their environment depend on: characteristics of the physical environment, knowledge, skills, cultural values and social organization.

Physical need for food is satisfied in this region by the fish, game, vegetables, and fruits available. The fishing, hunting and gathering techniques and the preparation and preservation of the food by the Indians of this region sustained them.

Vegetation in the Plateau Region includes edible berries and root vegetables. Berries were picked and eaten fresh and dried for use when not in season. There were annual runs of salmon up the major rivers. Deer, elk, mountain goat, bear, wolf, beaver, mountain lion, mink, land otter and antelope were found in this region. The salmon and meat was preserved by drying for future use also.

What do we use from our natural environment?

List the ways that each resource below can be used as a means of providing food (acquiring, preserving, preparing, storing, etc.).

Salmon	Bear	Wild berries	Water
Cedar bark	Stones	Cattails	Fir tree
Horn	Ferns	Roots	Oxalis
Deer/Elk	Dirt/Earth	Skins	Nettles

SMALL AQUATIC ANIMALS IN THE CISPUS

Focus To discover the distribution of insect larva in the Cispus River drainage.

Group Size Entire class, 6-8 per station, 3-4 stations

Time Required 1.5-2.5 hours

Materials

Screens*	Microscopes (*in water room*)
Plastic cups w/ lids	Data sheets
Eye droppers (*optional*)	1 yard square frame

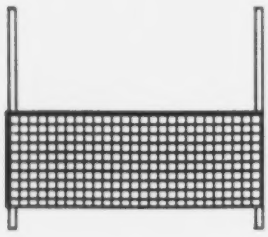
A Learning Guide to Aquatic Insects of the Cispus Region (*available at the Cispus Learning Center*)

Physical Setting Riffle area of either Yellowjacket Creek or Cispus River for taking samples
The water room, set-up with stereoscopic microscopes and insect guides.

Process

1. Choose an area of stream that is shallow, has moving water and plenty of rocks.
2. Lay the frame in the water to define a sample area of one square yard.
3. Have one child hold the screen downstream of the frame and have another student turn over all of the rocks in the framed area. Any insects in the frame area will flow with the stream into the net.
4. Students use the eyedroppers to 'capture' samples of the insect larva present and place them in sample cups. Other students count the number of insects caught in the screens. This takes patience. You have to look very closely to find all of the insects.
5. Estimate the width of the stream and share with the students that the Cispus drainage is two hundred square miles. Have the students speculate on the insect population of the entire drainage and whether it would support a population of consumers. Also have students speculate on what a small amount of petroleum or other pollutant would do to the population of insects and aquatic animals dependent upon them.
6. Take samples captured to the water room and identify the types of insects found using the stereoscopic microscopes. Have the aquatic insect guides available. (The choice of stereoscopic microscopes is so samples can be viewed alive and then returned to the stream.)
7. Samples may be drawn or simply identified and listed.

***Screens**
-4ft standard-width nylon screen
-2, 3' long, 1" dia. wood dowels
Wrap each screen end around one wooden dowel and staple in place. This should leave you with a seive about 3.5 ft long.



TAKE A LIKEN TO LICHEN

Focus To introduce the importance of fungus and lichen in the forest ecosystem.This will be accomplished through observation and a guided dramatization

Group Size Small group or entire class

Time Required 20 minutes

Materials Examples of Goats Beard Lichen, encrusting lichen (*on rocks*)
Hand lens
Optional -Signs to hang around the neck of 2 students - "Allie Algae","Frankie Fungus" (*These names allow for boys or girls*).

Physical Setting A forested trail with a wider area for discussion, or in a classroom with examples of different types of lichen brought in.

Process

1. Have some Goats Beard lichen in hand for them to look at closely. Examine with hand lens.
2. In order to explain that lichen is two plants growing together in a mutually beneficial relationship, choose two kids to portray the parts of the lichen - algae and fungus.Explain that "Frankie Fungus" is an organism which cannot make its own food (no chlorophyll) and has to get nutrition from decaying materials (dead logs, roots ,etc.). Fungus does have a solid structure and provides the home or place for the two plants to live. It is also capable of holding moisture. "Allie algae" on the other hand, is a green plant which contains chlorophyll, so it is the part of the partnership which provides the food. Usually algae must live in water, but because of the water-trapping ability of the fungus it can thrive on land.
3. Have the students link arms, thus Allie algae and Frankie fungus "take a lichen to each other". A silly way to remember that algae and fungus team up to form a partnership beneficial to both. *There is some evidence that over time the fungus will secrete a weak acid which will weaken the algae so the mutual partnership may benefit one side more than the other.
4. On a hike along Covell Creek or other forested trail tell students they will be looking for one of the forces important in the decomposition process in the forest. Have them look for Goats Beard lichen in the trees and encrusting lichen on rocks. This is an early stage in the successional process of breaking the rock down into soil. Over time the fungus causes an acidic chemical reaction and rock breaks down.

THE INBETWEEN PLACES

Focus To understand concepts of diversity, plant succession, and the effect of elevation on the type of vegetation in area by examining some inbetween places/transition zones

Group Size 15 - 20 students

Time Required 2.5 hours

Materials Good walking shoes.
Plant/tree identification manuals
Handout: ***The Inbetween Places***

Physical Setting The trail and immediate surroundings, from the Cispus Center to Angel Falls.

Process

1. Walk to Angel Falls and observe changes in vegetation along the way. Begin at the Covell Creek trail just outside the entrance to the Cispus Center. The trail generally follows the creek, but does weave its way sometimes right adjacent to the creek and other times as much as 100 yards away. There are many observable changes or "transitions" in the kinds of vegetation. These changes are mostly due to the available light and soil moisture, not elevation (There is only an 800 foot difference in elevation between the Center and Angel Falls--despite what the fatigue in your legs tells you!).

2. Going up, observations should be focused on the effects changes in soil moisture make on the kinds and amount of vegetation. There will be a temptation to return too fast because it's easier, but now look to see changes that can be attributed to variations in light during the growing season.

THE INBETWEEN PLACES

1. During the growing season what are the two main needs of all plants?
   1. 2.

2. On the way, about 75 yards up the path stop and look left into the forest. Note the number and kinds of trees. Now allow your vision to move towards the creek.
   a. Which area would seem to have more available soil moisture?

   b. In which area are there more kinds of plants growing?

3. Write a general rule relating numbers and kinds of plants and soil moisture:

4. Continue up the trail, making visual comparisons to test your rule.
   Stop at the third bridge to rest and to make a more detailed look at your surroundings. Is your rule still true?

5. You have only gone up about 100 feet at this point. What changes have there been in the kinds of plants nearer the stream?

6. The trail will begin to climb at a steeper rate now. Pay attention to the major changes in areas of high soil moisture. After walking for five minutes stop and observe the surroundings. How does local relief (steepness) affect the amount of water stored in the soil?

7. Where are most of the low plants growing in relation to the creek?

8. Proceed on to the falls, while continuing to make these comparisons. Then start considering a new element affecting plant growth--available sunlight. How does that affect plant growth going from the stream and into the forest?

9. As you look at Angel Falls, allow your vision to make these comparisons as you glance first at the falls, then gradually in stages away and into the forest. With the change in available sunlight and soil moisture what changes do you note?

10. Take the same path back to the Cispus Center. As you go look to see how these three elements--relief, soil moisture, and sunlight--interact and affect the variety and amount of plant growth. Consider these questions:

    a. In what area are most plants found?

    b. Where is most soil moisture found?

    c. In what area does most sunlight reach the ground?

    d. When steepness is greater what happens to variety and kinds of plants found?

When reaching the trail's end be sure to find a tree, lean into it and hold down your heels.

G22

TRANSITION WALK

Focus To observe changes in the forest in relation to water proximity.

Group Size Entire class

Time Required 1.5 - 2 hours

Materials Drawing paper
Pencils
Oil pastels

Physical Setting Start at the Cispus river and walk to the Burley Mt. trailhead

Process

1. Have children sit on the bank or on logs along the river and observe the types of plants present near the shore. They are primarily deciduous. Have students speculate on the types of animals that might utilize these species. Look for evidence of animals. Discuss the role of these plants in stabilizing the shoreline after the 1978 flood of the Cispus and Yellowjacket.

2. Make drawings of the plants and evidence of animal life found. There should be tracks and beaver cuttings where they have felled willow, cottonwood, and alder. There should also be some stored boughs in the water, for later consumption. Have the students look at the way beaver do their harvest, leaving enough of a stump to develop multiple new trunks and therefore fostering additional new food.

3. Move to the area immediately behind the deciduous plants and look at the plant life that predominates there. It is mixed cottonwood and cedar. However, if you look at the stumps around the area you will find primarily cedar stumps.

Debriefing:
Have the students define what factors control the types of plant life in each of the areas you have observed. Speculate on man's impact on each of the areas and nature's response to it.

4. Look for evidence that is making the transition back to what would be the climax forest for the river bottom. (There are cedar. Cottonwood are great for providing nitrogen to the soil though dead leaves and wood decay.)

5. Make drawings of the plant and evidence of animal life. Be sure to include man's use of the area as a source of building material.

6. Move to an area a level up from this one (behind the gym is fine). Look at the canopy plants that predominate this area. Have the students discuss why there are few low level branches. Look at the plants that provide ground cover.

7. Make drawings of plants and any evidence of animals that are utilizing this zone of the woods

UNIFORMITY AND DIVERSITY

Focus

To demonstrate that plant communities display both uniformity (*sameness*) and diversity *(differences)*.

Group Size

Small group to entire class

Time Required

30 minutes

Materials

Paper (*or journal*)
Clipboard
Pencil

Physical Setting

Covell Creek Trail from road to bridge.

Process

1. Teach concept of "uniformity" (how things are alike) and "diversity" (how things are different). Students brainstorm examples.
2. Walk into Covell Creek Trail about 30 to 40 meters from the road. Ask students to observe the plant community in this location. They should note and remember trees, shrubs and ground cover plants. Students may make a list of plants at this location.
3. Proceed another 75-80 meters along the trail (make sure that the plant community is the same as at the previous stop). Ask students to observe the plant community in this location. Again, they should note plants from all three layers of the plant community. Students may make a list. Ask students if the plants in this location are the same as the plants at the first stop or if they are different. The conclusion is that they are the same. Ask, "Does this plant community demonstrate 'uniformity' or 'diversity'?" Require that they give evidence for their conclusions. Students record conclusions and evidence or reasons in their journals.
4. Proceed to the first bridge across Covell Creek. Ask students to observe the plant community in this location. They should note plants in all three layers. Students may make a list. Ask students if the plants in this location are the same as the plants at the first two stops or if they are different. The conclusion is that a great number of the plants are different. Ask, "Does this plant community demonstrate 'uniformity' or 'diversity'?" Require that they give evidence for their conclusions. Students record conclusions and evidence or reasons in their journals.
5. Ask, "Is it possible for a plant community to demonstrate both 'uniformity' and 'diversity'? Discuss. Students record their conclusions and rationale in their journal.

Optional:
Ask the students to observe the plant community along the creek, both up and downstream from the bridge. Ask them to observe what happens to the plant community on either side as one moves away from the creek (The upper canopy changes from deciduous to coniferous). Ask students to identify reasons for the changes.

The Kitchen Sink

BIRD ON A STICK

Focus To allow road and window killed birds to be salvaged for use as study skins. Permit for salvaging is required, contact Cispus for information.

Group Size For instructor use

Time Required 3 hours minimum (*varies with specimen*)

Materials

Metric ruler	Vernier-type calipers	Scale
Display Tags	Dissecting pan/pad	Blunt scissors
Dull blade	Dissection scissors	Blunt probes
Forceps	Cleaning sink	Mild soap
Carpet thread	Low-intensity hairdryer	Suturing needle
Dissection pins	non-absorbent cotton	Mist pins
Bird I.D. Bood	Bird anatomy book	Wooden dowel*
Spray bottle**	Styrofoam drying pad	

Slides of the dissection steps may also be available from Cispus
**Diameter and length depend on specimen*
***filled with water*
(Clipped nails are helpful, even a very short length has the tendency to tear the specimen's skin)

Physical Setting Classroom with sink and good lighting

Process

Activity 1: RECORDING INFORMATION
To have an actual scientific specimen you'll need this information. Otherwise, all you have is a stuffed bird.

1. *Body Measurements*
   - •wing cord (wing-bend to longest primary)
   - •length (beak to longest tail feather)
   - •weight (dead and/or live)
   - •tail length
   - •tarsus length
   - •culmen length
   - •wing extension
2. *Physical Descriptions*
   - •color of soft parts (iris, cere, fleshy eye ring, inside of mouth, tongue)
   - •color of feet, claws and bill
   - •is culmen exposed
   - •amount of body fat
   - •male or female
3. *Collecting Information*
   - •common and scientific name
   - •manner of death
   - •where and when collected
   - •collected by
   - •prepared by

Activity 2: DISSECTION

1. Plug mouth and damaged eyes with non-absorbent cotton.

2. With the body facing left, make an incision from the base of the sternum to the vent, without cutting through the abdominal wall (Dampen the chest feathers and part them if you are unsure where to start the cut). The skin here is usually very thin, which makes it difficult to determine how deep to make the initial cut. If you do cut into the abdominal wall, separate the chest skin from the flesh and continue the process, cutting the skin only, and being careful of the damaged area.

3. Using borax to absorb moisture, loosen the skin from around the chest on one side of the body and down to the abdomen to expose the hip (tibia and femur) joint.

4. Grasp the leg and push it up through the hole, to better expose the joint.

5. Place a probe behind the joint, then with blunt scissors or a scalpel, cut the joint, detaching it from the body (when your instrument hits the probe you know when to stop the cut).

6. Repeat on the other side.

7. Work the skin loose around the back of the bird.

8. Separate the tail from the body by cutting the "parson's nose", leaving the tail feathers attached to it.

9. Peel the skin down the back and sides until the base of the humeri are exposed.

10. Place a probe behind the shoulder joint, then with blunt scissors or a scalpel, detach the wing from the body.

11. Repeat on the other side.

12. Pull the skin over the neck and to the base of the skull.

13. Detach the head and neck from the body, by cutting at the joining of the neck and shoulders.

14. Detach the ears from the skull by using forceps to pull out the membranes.

15. Remove the body from the skin. Set aside for sexing and to use as a size model for stuffing.

16. Pull the skin to expose the eyes, taking care not to stretch the eyeholes.

17. With a scalpel, carefully cut the membrane joining the skin and the eyeball. Make the incision far enough back to avoid cutting the skin on the eyeball.

18. Peel the skin over the eye and remove the eyeball with forceps.

19. Using blunt scissors, sever the head from the neck at the extreme base of the skull.

20. Peel skin the remainder of the way up to expose the skull. If the skin begins to dry out or is stiff, moisten it with water. Strip the brains (you will need to cut a small hole in the back of the skull to do this), tongue, and all removable flesh from the skull (be careful not to let the beak cut through the skin).

21. Loosen the skin around the legs, working down to the knee joint and strip all removable flesh off of the bone.

22. Loosen the skin down the wings as much as possible. Detach secondary feathers from the ulna, and strip all removable flesh from the ulna and radius.

23. Remove the flesh of the parson's nose, be sure to get the oil gland too.

24. Wash the skin with mild soap and water. Gently removing any remaining fat and flesh. Don't let the skin soak, or you may spend an hour or two patting dry the feathers!

25. Pat dry with a paper towel, then gently blow-dry skin and feathers, taking care not to dry out the skin.
25.a If you had a tough time getting the skin over the skull you will want to concentrate on the head first. Go through steps 24-26; once the SKULL is treated with borax, stuffed, and turned right-side-out continue drying and treating the rest of the skin.

26. Work the inner skin and bones with Borax to preserve them.

27. Put cotton balls into the eye sockets, and pull the skin carefully back over the head.

28. Tie the ends of the humeri together and place in the mid-back of the opened skin.

29. Twirl enough cotton onto the display dowel to approximate the birds body (use the original body as a model). There should be little or no cotton at the neck area. The display dowel is sharpened at one end and it is about eight inches longer than the specimen. This will allow the bird to be held by the beak and dowel handle between it's feet, keeping the specimen in good shape even with extensive use.

30. Blowing open the neck hole, place the body-stick (with the head-end sharpened) into the skull. Anchor it firmly into the base of the bill and nasal area, but without sticking it out through one of the nostrils. The bird's head should be positioned so that the bill points in the opposite direction of the feet (up), allowing it to lie flat and fit into a drawer.

31. Place the body stick into the opened skin and work the skin closed around it. Sew up using a baseball stitch. Leave the stitches loose, then "draw up" on the end threads to pull the skin closed.

32. Cross the tarsus of one leg over the other, and tie them in position over the stick.

33. Attach the identification tag.

34. Sex the bird and label tag appropriately. If the bird was not recovered in the spring the sexual organs may be shrunken and unidentifiable . If that is the case, you may be able to determine sex by the plumage or size. If you have no way to identify the sex, state the reasons on the identification tag.

35. Set the bird, stomach-side up, on the drying pad. Using a pin, gently fluff and pat the feathers into the position they would hold naturally. You may wish to consult nature magazines, or other detailed photos and illustrations. Pins and paper can be used to keep feathers in place while they set. Let the specimen dry undisturbed for several days.

36. Check the specimen, re-arranging feathers as necessary. Let dry for another three days. Then, store carefully until needed.

Notes:

CISPUS DAWN

Focus To use sensory stimulation to aid in creative writing.

Group Size Entire class

Time Required 20-30 minutes

Materials
Cassette player
Cassette tape, "Dawn to Dusk"
Pen
Student notebook
Handout: ***Cispus Dawn***

Physical Setting Cispus Star/Mural Room

Process

Activity 1 : CISPUS DAWN

Preview "Dawn to Dusk," cassette #6, found in the Cispus Library. You will want to practice technique with lights and sound before presenting to your students.

1. Take your students to the Mural Room, also known as the "Star Room," located adjacent to the auditorium. Turn on regular lights only (push the button) and manipulate the dimmer to full light first. (Don't even try the light switch located just above the dimmer as this will engage the ultra violet light and you'll loose the focus of this lesson.)

2. Allow students time to pick out known Cispus sites, i.e., Tower Rock, or Covell Creek. Have the students sit down where they can see a favorite mural.

3. Turn on the tape player, softly at first, then a little louder. Discourage conversation.

4. Have students turn to the, ***Cispus Dawn*** activity in their workbooks. Review the basics of simile and metaphor. Guide them through the questions or have them respond spontaneously to their feelings. It may help to have them close their eyes for about 30 seconds and let the images just seen and heard come together.

5. Now, have the students respond to the questions without talking to their neighbors, or showing them what they've written.

6. After allowing time to complete the questions, call on specific students to share. This way some who normally wouldn't raise their hands will have an opportunity . Be ready for pleasing observations.

7. Ball point pen is suggested so students won't want to erase and start over; it encourages creativity. At a later time, back at the dorm or at school, grammar can be corrected.

Extensions:
1. Try other creative writing activities here, like cinquains or haiku. See poem templates in "**THE CISPUS EXPERIENCE**", p. CI-13.
2. Try the exercise, going dusk-to-dawn.
3. Change the mood by putting in a different tape, or turning on the ultra violet lights while leaving enough regular light to see and write.

Cispus Dawn

1. What are the feelings you have right now about this place? (Make use of similes and metaphors.)

2. Without using your senses of touch and smell, choose something in the mural and try to describe its feel and smell.

3. If you could be in one of the murals right now, where exactly would you like to be? Why? What would you like to be doing?

4. Become something shown in one of the murals or become something that might belong there, but isn't shown. (a) Describe yourself (you can be big like a mountain or small like a drop of water). (b) If it is spring how would your activities be different in the opposite season (fall)?

5. Draw yourself (from question 4).

HOW FAR DID YOUR BREAKFAST TRAVEL ?

Focus To emphasize the importance of locally or regionally grown foods by exploring the demand for out-of-season crops and many internationally grown foods. And to consider what these demands cause: the expansive centralization of distribution systems, which intensify the use of energy and the increase in distributive inequality.

Group Size Entire class

Time Required 1 hour

Materials

World Map	String or yarn
Washington Map	Pins
USA Map	Labels

Physical Setting Classroom or outside

Process

1. Ask the students to make a class list of the foods they ate for breakfast.
2. Use the world map to find out where these foods originated. Use yarn or string and labels to demonstrate this. Select foods that are not highly processed but composed of one main ingredient, i.e., bananas-South America; grapefruit-Texas, California, Florida; orange juice-Texas, Florida. Use yarn to connect the origins with the hometowns of the students.
3. Discuss with the class how far some foods travel to get to us, and how some foods can be found closer to home. What does this mean in terms of energy used? What are the various forms of energy used to transport food to our mouths? Discuss trucks, planes, trains, fuel, and human energy for production and distribution of food. Make a class list of jobs necessary to produce the desired food, i.e., graphic designers for advertising and pesticide companies, etc. Discuss natural resources expended for food distribution. Discuss growing terms "locally" and "regionally".
4. What are our favorite foods? Are they grown locally or regionally? Are there foods that we like or depend on that are not grown locally? Can we consider local or regional substitutes? Discuss peoples close relationship with the land and growing seasons prior to the centralization of food distribution.
5. Invite a local farmer or speaker to talk about what kinds of foods are available in this region and when they are in season.
6. Plan and prepare a meal using local foods. Preparation of a meal is optional.
7. Analyze a Cispus meal.

Reference:
This lesson was created with information from the Energy, Food, and You curriculum guide, a program of the Washington State Offices of Environmental Education (N.W. Section) and Health Education.

INDOOR CAMPFIRE

Focus To conduct campfire activities indoors when there is extreme weather outside.

Group Size Entire class (no more than 40)

Time Required 1-2 hours

Materials

- The Cispus electric campfire
- Songbooks
- Musical instruments
- Cassette player (opt.)
- Rocks for fire ring (opt.)
- Songsheets
- Skit materials

Physical Setting Cispus Center Star/Mural Room

Process

Activity 1: SETTING UP

1. You can set up the electric campfire almost anywhere in the room that you wish (all but one wall has electrical outlets), but be sure to tape the electrical cord to the floor only. Make sure that no tape, stickers, pins, or gum end up on the walls.

2. Respect room rules of no food or beverages.

3. For ventilation you might want to leave the door ajar or fully open, leaving the hallway light off to maintain a campfire mood.

4. The regular lighting can be turned off once your campfire is going, or the dimmer switch can be turned down to a comfortable level. You might also wish to turn on the ultra-violet lighting (light switches), charge up the stars, and have a star-lit campfire. Trying out the variations before-hand will have your evening running smoother.

5. Good campfire programs don't just happen, they're created with careful planning. Follow suggestions in "**THE CISPUS EXPERIENCE**" pp. CI-6,7 and CI-25,26 for songs, skits scripts, and short story ideas. Create a program to meet your needs. Activities planned for an outdoor campfire can usually be easily adapted for the indoor setting.

Activity 2: THE CLEAN-UP

1. You've all had a great evening singing and telling stories around the campfire. Now it's time for the assigned clean-up crew or staff members to make sure that everything is picked up, all the lights are shut off, and the room is locked; ready for the next group.

THE BIG PICTURE

Focus

To allow the student an opportunity to make connections between ideas and concepts and form a holistic understanding of what they learned about nature and the environment at Cispus.
To allow the student an opportunity to share his/her experience at Cispus with a parent.

Group Size

Entire class
Individual student and parent

Time Required

1 hour

Materials

Pencil
Brainstormed list of ideas, concepts and experiences
Handout: ***The Big Picture****

Physical Setting

Classroom and student's home

Process

1. After returning from the Cispus experience, a whole class activity is conducted where students brainstorm ideas, concepts, experiences, and understandings from their time at Cispus.

2. Ideas are recorded. Students classify ideas and define relationships between them. This can be done in an idea web or list format. The format is reproduced for student reference.

3. Students take the formatted document home. They use the document to share their experience at Cispus with their parent(s).

4. Parent and student together fill out ***The Big Picture*** form, summarizing the student's understanding of concepts and ideas. Students may illustrate concepts if they choose. The student and parent(s) sign the form before returning it to school.

5. Students return ***The Big Picture*** forms, which are then collated, published, and distributed to students and their families.

* The form is a one page form with a scroll format printed on it defining the work space.

UNNATURAL OBJECTS TRAIL

Focus To help students be more observant of features along the trail by slowing down and really looking at surroundings. This is especially effective soon after arrival at camp.

Group Size Entire class or small group

Time Required 15-20 minutes

Materials 20 (or so) objects which would not naturally occur along a trail, ideas might include blocks of wood, yarn, strips of rubber, a house plant, plastic, hanger, anything - use your imagination!

Physical Setting Any section of trail where objects can be hidden. Covel Creek, Pond or River Trails would be appropriate.

Process 1. Before meeting the group the leader places the objects along the trail in areas visible from the trail, but not overly obvious. Placement could include: on the ground, in bushes and trees, wrapped around trees, hanging from above.

2. Students walk the trail silently in single file observing and silently counting and noting locations of objects. Counting on fingers is helpful. At the end of the trail students share the number of objects they observed without telling what the objects were. Walking back along the trail in the opposite direction students again observe and count objects. The trail is walked a third time as the students and leader point out the objects. They can also be collected at this time . A discussion of careful observation techniques for the trail is a good closing.

Be careful not to leave even a single "unnatural object" to spoil the quality of the trail for others.

UP TO NOW...
Reflections on the day

Focus

To provide the student an opportunity to reflect on what was learned and experienced through the day, including feelings and goals. To provide the teacher with a vehicle to learn the feelings, concerns, and insights of the individual student.

Group Size

Entire class or group

Time Required

15-20 minutes

Materials

Pencil
Clipboard
Handout: *Up To Now...*

Physical Setting

Classroom or anywhere student can thoughtfully reflect on his/her experiences and feelings.

Process

1. Teacher meets with class or group. Students discuss their experiences and reactions to the day's events. They share what they learned, what they enjoyed, what problems they had, goals for the next day, etc.

2. ***Up to Now...*** sheets are passed out. Student finds a place where he/she can think and reflect on the day. The student fills out the handout.

3. Completed handouts are collected by the teacher, then returned to the student for inclusion in the student's journal. They will not be graded, as they are a means of sharing ideas and feelings with the teacher.

Today is_____
(date)

UP TO NOW...

1. Today I learned...

2. The big idea for me today was...

3. The hardest thing for me today was...

4. I only wish...

5. Tomorrow I'll...

_____
(signed)

WEATHER SCAVENGERS

Focus To think about and find examples of how weather affects plants, soil, people and animals.

Group Size Entire Class, divided into small groups.

Time Required 1 Hour

Materials
Scavenger Hunt Clue Sheets
Bags
Pencils and paper
Clipboards

Physical Setting Cispus Trails -- Covell Creek or the Pond Trail are good.

Process

1. Tell your group that they will be going on a walk to see how many weather related things they can find.

2. Give each team a clue sheet, a bag, a pencil, 4 sheets of white drawing paper and a clipboard.

3. Explain that they can put some of their "weather finds" in their bags. The clues they can't collect they should draw or write a description of on their blank sheets of drawing paper.

4. Set a time for all the teams to meet back at the starting point. Have each team show and explain what they have found for each clue. Afterward, have each team return any "finds" to where the items were found.

Note:
Before sending the group out, make sure to set your scavenger hunt guidelines, such as "Do not pick flowers, reach under logs with bare hands, go down to the river or wander away from the rest of the group". Set boundaries for the scavenging area.

WEATHER SCAVENGER CLUE SHEET

1. Something bending toward the sun
2. Something hiding from sunshine
3. Something that may become part of a cloud
4. Something that tells you that the wind is blowing
5. Something left by the rain
6. A bad place for a person to seek shelter during a lightning storm
7. A place where icicles might form
8. A place where weather has damaged a building
9. A place to go where its cool
10. Sign of an animal that likes rain
11. A place where rain has moved the soil
12. A place that gets little sunshine
13. Something that won't bend in the wind
14. Something that reflects a lot of sunlight
15. Something that absorbs a lots of sunlight
16. Something that will soak up rain
17. Something that makes rain spatter
18. Something that protects people from rain
19. Something that uses sunlight or wind or water to work
20. Something that smells better after a rain shower
21. A good windbreak
22. Something shaped by wind or water
23. Something the color of the sky
24. Something the color of the snow
25. Something that would make snow melt
26. A sign of lightning damage
27. Something that bends in the wind

L14

WEATHER WATCHING
by the chart

Focus To use field exploration and observations to explain how cloud types, wind direction, and air pressure can be used to forecast the weather.

Group Size Entire class, divided into groups.

Time Required 1/2 hour per day during your stay at Cispus.

Materials

		Cispus Weather Station:
Cloud chart		Barometer
Wind sock	or	Wind speed and direction guage

Handout: ***Weather by the Chart***

Physical Setting Cispus Weather Station

Process

To introduce weather forcasting to your group, they will need to know how clouds, wind, pressure, and temperature all interact. In this activity your group can practice forecasting using a simple weather forecasting chart that focuses on cloud types, air pressure, and wind direction.

For help with identifying clouds, pass out or mount, on a large sheet of cardboard, a Cloud Chart.

You can send for a full-color poster with photographs of cloud types. Send to:
Science Associates
P.O. Box 230-8
Princeton, NJ 18540
Tele: 609-924-4470

1. Divide your group into three teams: Cloud Team, Pressure Team, and Wind Team.

2. At a specific time each day, have each of the weather forecast teams take a "reading" on what's happening outside or at the weather station. (The Pressure Team will have to take one or two readings earlier in the day to find out if the pressure is rising, falling, or staying the same.)

3. After each team has recorded their data on the record sheet, have the teams compare their readings to the list on the Weather Chart. The student will write down the number that corresponds to their team's findings. For example, if there are cumulus clouds outside, the Cloud Team should write the word cumulus on the cloud list and then write down the number that corresponds to that cloud type. In the case of cumulus clouds, the number would be 7. Have the Pressure and Wind Teams take readings with their instruments and do the same thing.

4. Next have the teams add the three numbers to get a forecast number. By looking at the chart they can find the forecast that matches their number.

5. Each group of teams can take a day while at Camp Cispus and report a forecast for the next day's weather.

WEATHER BY THE CHART

CLOUDS

CUMULONIMBUS	1
STRATUS	2
LOW, THICKENING	3
HIGH CLOUD	4
CLOUDS RISING	5
CLEAR	6
CUMULUS	7

WINDS

N	2
NE	1
E	1
SE	1
S	2
SW	3
W	3
NW	4
VARIABLE	3
CALM	3

PRESSURE

VERY LOW AND DROPPING	1
LOW AND DROPPING	2
LOW AND FLUCTUATING	3
AVERAGE AND DROPPING	3
HIGH AND DROPPING	3
VERY HIGH AND DROPPING	4
AVERAGE, FLUCTUATING	5
LOW, RISING	6
AVERAGE AND RISING	7
HIGH AND RISING	8
VERY HIGH AND RISING	9

WEATHER FORCASTER

3	Heavy preciptation within six hours
4	Precipitation within 6 -12 hours, little temperature change
5	Brief precipitation withing 18 hours, rise in temperature
6 or 7	Precipitation within 24 hours, rise in temperature
8	Precipitation within 30 hours, no temperature change
9 or 10	Increase in clouds
11	Little precipitation in next 24 hours
12	Winds with possible showers
13 or 14	Immediate precipitation, then clearing and cooler
15	Showers or flurries, then clearing and cooler
16	Clearing in a few hours
17	Partly cloudy, no temperature change
18	Fair with little change in next 36 hours
19	Mostly fair with rising temperatures
20	Continued fair

WEATHER WIZARD
TEAM RECORD SHEET

PRESSURE TEAM _____

WIND TEAM _____

CLOUD TEAM _____

TOTAL _____

OUR FORECAST DATE

L18

The New Stuff

THE CISPUS EXPERIENCE...ENCORE

A companion to THE CISPUS EXPERIENCE, Curriculum Guide

Cispus Curriculum Writing Team
January, 1994

Linda Marie Arthur
St. Mary's School
Arch Dioceses of Seattle, Aberdeen

Chuck Bergquist
Columbia Heights Elementary
Longview School District

Roy Carlson
Mill Pond Intermediate
Yelm School District

Joe Fenbert
Cispus Learning Center
ESD 113

Mike Gullickson
Cedar Heights Junior High
South Kitsap School District

Bill Hickle
Garfield Elementary
Olympia School District

Carol Kegel
St. Mary's School
Arch Dioceses of Seattle, Aberdeen

Jane Poole
Mill Pond Intermediate
Yelm School District

Linda Lee Tatro
Mill Pond Intermediate
Yelm School District

Terry VanMeter
East Olympia Elementary
Tumwater School District

Ron Ward
Union Ridge Elementary
Ridgefield School District

Kathy Wilkes
Hudson Park Elementary
Rainier, Oregon School District

Cispus Intern Writing Team
Spring and Fall, 1993

Jill Anagnos
Audubon Expeditionary Institute

Julia Shipley
Audubon Expeditionary Institute

Teresa Sanford
Washington State University

Cispus Curriculum Writing Team
February, 1995

Janel Kegeler
Grant Elementary
Tacoma School District

Kathy Wilkes
Hudson Park Elementary
Rainier, Oregon School District

Monica Robertson
Grant Elementary
Tacoma School District

Ron Ward
Union Ridge Elementary
Ridgefield School District

Cispus InternWriting Team
Fall, 1994

Katie Hester
Smith College

Kevin Osborne
Washington State University

Project Editor
Lorene Sanford
Technical Writing Consultant

Assisting Editor
Jim Garner
Program Coordinator, Cispus Learning Center

Project Coordinator
Martin E. Forun, Jr.
Manager, Cispus Learning Center
© 1994, Cispus Learning Center

The Cispus Experience...Encore

Table of Contents

Starry-Eyed

(the blue section)

stars, constellations, heavenly bodies

Title	Focus	Time	Pg.
Create A Constellation	identifying & creating constellations	40 min	B1-3
Lunar Lookout	phases of the moon	30 min	B4-5
Meteor Shower	meteor shower observation		20 min
B6			
Night Sights	constellation identification		1 hr
B7-10			
Way Up North	polar constellations, mythology & history	1 hr	B11
Written In The Stars	five polar constellations & their legends	1 hr	B12-14

Wear-It-Away

(the orange section)

rocks, plants, soil, and the effects of time and nature

Title	Focus	Time	Pg.
Chewy Conglomerates	create an edible sedimentary rock	30 min	O1
Chip Off The Old Rock	effects of weathering on rocks	30 min	O2
Clearing The Muddy Waters	sedimentation as flip-side of erosion	20 min	O3
Crack, Crumble & Carry	weathering, erosion & deposition	1.5 hrs	O4-10
Down & Dirty: Soil Profile	make up of soil layers	1.5 hrs	O11-12
Nowhere To Run	erosion & plants	30 min	O13-14
Reading The Landscape	glaciers & the Cispus Valley	1 hr	O15-16
Thar's Gold In Them Hills	recreational geology	30-60m	O17
What Dug This?	natural forces & the Cispus Valley	1-2 hrs	O18

Local Landmarks

(the purple section)

local points of interest that are no farther than a day-trip

Title	Focus	Time	Pg.
Finding Your Way On Mt. St. Helens	Mt. St. Helens Volcanic Monument	30-45m	P1-2
Last Indians In Layser Cave	story & archaeological discoveries	1 hr	P3-10
Light In The Dark: The Braille Trail	forest ecology	1.25hrs	P11-13
Mt. St. Helens 2000	a time-line of recovery for Mt. St. Helens	1.5hrs	P14-15
Mt St. Helens Eco-Comparisons	ecosystems of 3 Mt. St. Helens areas	6-6.5hrs	P16-24
Physical Relief At Cispus	features of the Cispus area	3hrs	P25
Pinto Rock: Volcanic Plug	Cispus area mountain origins	2.5hrs	P26-28
Silent Voices, Vital Clues	Layser cave w/o the visit	40min	P29-30
Stone Age Tool Making	flint knapping & Layser Cave inhabitants	1-2hrs	P31-32
The Dig	appreciation of archaeology	1hr	P33-35
Where Was That?	mapping the Braille Trail	1hr	P36

Careful Consideration

(the red section)

safety and survival tips

Title	Focus	Time	Pp.
Aiming For Safety	Archery safety practices	10min	R1
Be Prepared, Or...!?	traveling with survival materials	20-50m	R2-4
By Nature's Rules	dangers of traveling unprepared	1hr	R5-7
Hang On!	controlling fear in survival situations	45min	R8
Survival Simulation	applying survival techniques	2.5hrs	R9-11

Make It Last

(the yellow section)

resource use and responsibility

Title	Focus	Time	Pp.
Bradston: City In Need	water resource use	2hr	Y1-7
Endangered Species: Whose Fault?	reasons behind species endangerment	30-40m	Y8-9
Focus On Freedom	self-sufficient lifestyle	2.5hr	Y10-11
Foresters Log Trees, Right?	what foresters do	40min	Y12-13
Future Of Wildlife	wildlife threats, management, & history	1hr	Y14-16
No Power? No Problem.	living w/o externally supplied electricity	2.5hr	Y17
Stomped To Death	foot traffic and wilderness	1.5-2hrs	Y18-19

Threads In The Web

(the green section)

the interconnectiveness of the elements in an environment

Title	Focus	Time	Pp.
Birds Of A Feather	Feathers as a means of adaptation	20min	G1-2
Critter Coping	methods of adaptation	1hr	G3-5
Everybody's Gotta Eat	food chains	30-45m	G6-7
In These Ancient Trees	biodiversity & old growth	1hr	G8-10
Known Cones: A Key To Conifers	simplified dichotomous key	30min	G11-1
Me And Your Shadow	sunlight tolerant & intolerant plants	1hr	G15-16
Mowitsh, Salal, Pish	Native Americans, environment, & food	1.5hrs	G17-18
Small Aquatic Animals In The Cispus	insect larvae in the Cispus	1.5-2hrs	G19
Take A Liken To Lichen	lichen in the forest ecosystem	20min	G20
The Inbetween Places	diversity, plant succession & elevation	2.5hrs	G21-22
Transition Walk	plants and water proximity	1.5-2hr	G23
Uniformity And Diversity	uniformity & diversity of plants	30min	G24

The Kitchen Sink

(the limegreen section)

lessons that didn't quite fit anywhere else, but they're still real neat

Title	Focus	Time	Pp.
Bird On A Stick	make a study skin (instructor use)	3hrs	L1-4
Cispus Dawn	creative writing	20-30m	L5-6
How Far Did Your Breakfast Travel?	importance of locally grown food	1hr	L7
Indoor Campfire	campfire in the Star Room	1-2hrs	L8
The Big Picture	create a holistic view teachings	1hr	L9
Unnatural Objects Trail	observation practice	15-20m	L10
Up To Now...Reflections On The Day	reflect on feelings and learning	15-20m	L11-12
Weather Scavengers	effects of weather	1hr	L13-14
Weather Watching	weather measurements and forecasts	varies	L15-18

The New Stuff

(the very pink section)

lessons created during the 1995 curriculum session

Title	Focus	Time	Pp.
The Answer May Not Be "Clear"	differences in logging technique	1.5hrs	VP1-2
Classroom Ecosystem	manipulation of environmental elements	sev wks	VP3-4
Compass Course Extension	extension to previous course lessons	30min	VP5-6
Cruising the Clearcut	determining board feet of a tree	30min	VP7-8
A Different Slant on Slope	detemine slope of different soil areas	varies	VP9
Diverse Diversity	three branches of biodiversity	1.5hr	VP11-12
FedEx That Packing Material	biodegradability of packing material	sev wks	VP13
Heart to Heart	monitoring of b.p.m. during activity	45min	VP14-17
Hot or Cold, Wet or Dry	weather predictions	20min	VP18
Hot Words for Kool Kids	geologic terms for Mt. St. Helens	20min	VP19-23
Habitat Observation Lessons:			
1. Looking Out Your Window	defining urban environment	1hr	VP24-25
2. Learning About Your Habitat	habitat and environment comparison	1hr	VP26-27
3. Photographic Field Observations	photographic record of urban observations	50min	VP28-30
4. At Peace With Nature	unobtrusive observation of nature	1hr	VP31-32
5. Photographic Field Observation	photographic record of non-urban observation	1hr	VP33-35
6. Photographic Field Observation Report	report of photographic records	1hr	VP36
Make Money, Make Cards!	use research to create nature gift cards	1hr	VP37-38
Mapping Mt. St. Helens Interp. Center	guide of Mt. St. Helens Interp. Center	5-20min	VP3940
Mt. St. Helens Follow-Up	follow-up and guide to Mt. St. Helens	1-2 hrs	VP41-42
Seeing the Weather Scene	observe the results of weather	30min	VP43
Tall Timber	determining height of a tree	30min	VP44
There's A Lot of Shaking Going On!	questions for Mt. St. Helens visit	1-2hrs	VP45-50
Tie Dye Camp T-Shirts	tie-dye shirts for wear at camp	1hr +	VP51-52
When I Am 21	observe/predict changes to Mt. St. Helens	1hr +	VP53-56
Wild Winds and Rainy Rhymes	observe weather and make predictions	30min	VP57-59
Words of a Feather	create writings from sensory/topical lists	30min	VP60

THE ANSWER MAY NOT BE "CLEAR"

Focus To demonstrate the differences between two methods of logging: clearcut and selective.

Group Size 20 or more (*most effective*)

Time Required 1.5 hours

Materials 20, or more, students and their imaginations

Physical Setting Large open space
Outdoors--Cispus Field **(if weather permits)**

Process Divide students into following role-playing groups:
-stand of uneven-aged trees *(half of the class or more)*
-moss -lichen -bear -deer
-elk -owl -bat -field mouse
-flying squirrel -red shafted flicker
-pileated woodpecker
Use students' imaginations for other possibilities.

Activity 1

1. Present to students the economic benefits of a clearcut:
   a) Enables foresters to create even-aged forests of a desirable tree species that will be capable of producing crop after crop of valuable timber.
   b) Provides the most complete preparation for manipulated regrowth.
   c) Provides for large timber yields.
   d) Cheap

2. Begin student role-playing in large, open area.
   Trees: students should stand tall with arms reaching above their heads.
   Moss and lichen: cling to a tree or lie below it
   Animals: encourage creativity in role-playing.
Encourage sound and movement for all roles.

3. After a few minutes of experiencing the workings of a living forest, tell the students that this forest is going to be clearcut.

4. Trees should squat to ground-level and become stumps. There are now no trees left standing.

5. Encourage discussion.

VP1

Activity 2

1. Begin student role-playing in large, open area. (same as activity 1.)

2. After a few minutes of experiencing the workings of a living forest, tell students that this forest is going to be selectively logged.

3. Randomly tap one-third of trees on the shoulder. These trees should squat into the "stump" position.

4. Encourage discussion.

Activity 3

Develop an open discussion around the following questions.

1. What are your feelings about the clearcut?

2. After a clearcut, seedlings are often planted. With selective logging, the surrounding trees will take care of reforestation. Have students discuss their feelings around the differences.

3. How did the clearcut affect the diversity of life within the forest? Selective logging?

CLASSROOM ECOSYSTEM

Interdependence and Population

Focus To create a controlled grassland ecosystem, manipulate elements within it, and make observations and predictions of what has, and will, occur.

Group Size Entire class

Time Required Daily observation over a several week period (*or indefinitely*)

Materials

Vegetable peelings	Gravel, humus and/or potting soil
Chameleons	Male and female crickets
Dead branch	Jar lid filled with wet sand
Shallow water dish	Fast growing grass seed

10 gallon or larger aquarium w/tight-fitting screen cover

Physical Setting Classroom

Process

1. Prepare aquarium with a shallow layer of gravel and a few inches of soil, sprinkle thickly with grass seed, water frequently, and keep in sunlit window.
2. Students or teacher creates a chart or book for students to make daily observations for watering, and germination.
3. When grass crop is thick and healthy add a few crickets and the jar lid filledwith wet sand (for laying their eggs). Move the container out of direct sunlight, but continue watering the grass.
4. Make daily recordings on the chart, or in the book, of cricket population and changes in the grass environment. Also, begin to make predictions about the grass and crickets based on what is happening in the environment
5. If the cricket and grass populations remain in balance, choose one of the following steps. In all cases, record daily changes in plant and animal populations, and continue to make predictions.

Step 1: Add more crickets. Increase the cricket population artificially without providing extra food. Is the grass crop an adequate food source?

Step 2: Add more crickets and supplement their food with fresh fruit and vegetable scraps.

6. If the cricket and grass populations do not remain in balance, i.e. the crickets destroy the grass crop, the experiment is over and the students should work on evaluating their research. If a balance is maintained with the student's help, alter the environment slightly by adding dead branches, and a rock or two. Add one chameleon (insectivore) to the aquarium. Observe what happens to the cricket population.
8. Allow the experiment to end naturally or keep the chameleon and crickets alive as classroom pets.

VP3

Carrying Capacity and Overpopulation questions

Name/Date_____

1. Describe the grass crop at the beginning of the experiment. At the end of the experiment.

2. How many crickets were living in the manmade environment and surviving in a healthy condition?

3. If you followed Step 1, when did the cricket population become too large for the food supply?

4. If you followed Step 2, did the inclusion of the chameleon alter the cricket population?

5. Speculate as to what might happen if you added several chameleons to the container.

6. Draw conclusions as to the carrying capacity of your grassland community. For crickets. For chameleons.

COMPASS COURSE EXTENSION

Focus An extension to compass course lessons found in the Cispus Experience.

Group Size Small group of 2-3 students

Time Required 30 minutes

Materials A meter or yard stick (*optional, 100 foot tape measure*)
Handout: ***Compass Course Key***

Physical Setting School yard or other outdoors area with tall trees

Process Cispus already has a compass course laid out. On the south side of the parking lot by the auditorium, numbers 1 to 20 are marked three feet apart by the curb. On the following page are twenty courses that will lead students from one number to another.

Compass Course Key

Starting Point No. 1
Go 60 degrees for 45 feet
Then 346 degrees for 60 feet
Then 211 degrees for 83 feet
Destination Point No. 6

Starting Point No. 2
Go 6 degrees for 60 feet
Then 126 degrees for 45 feet
Then 245 degrees for 61 feet
Destination Point No. 7

Starting Point No. 3
Go 333 degrees for 60 feet
Then 154 degrees for 30 feet
Then 204 degrees for 17 feet
Destination Point No. 10

Starting Point No. 4
Go 78 degrees for 45 feet
Then 352 degrees for 42 feet
Then 210 degrees for 63 feet
Destination Point No. 1

Starting Point No. 5
Go 53 degrees for 54 feet
Then 272 degrees for 36 feet
Then 180 degrees for 38 feet
Destination Point No. 2

Starting Point No. 6
Go 357 degrees for 45 feet
Then 90 degrees for 30 feet
Then 216 degrees for 53 feet
Destination Point No. 4

Starting Point No. 7
Go 72 degrees for 45 feet
Then 320 degrees for 30 feet
Then 195 degrees for 45 feet
Destination Point No. 3

Starting Point No. 8
Go 7 degrees for 60 feet
Then 114 degrees for 48 feet
Then 217 degrees for 60 feet
Destination Point No. 2

Starting Point No. 9
Go 85 degrees for 75 feet
Then 287 degrees for 60 feet
Then 200 degrees for 29 feet
Destination Point No. 6

Starting Point No. 10
Go 69 degrees for 45 feet
Then 317 degrees for 60 feet
Then 178 degrees for 63 feet
Destination Point No. 9

Starting Point No. 11
Go 60 degrees for 45 feet
Then 346 degrees for 60 feet
Then 211 degrees for 83 feet
Destination Point No. 16

Starting Point No. 12
Go 6 degrees for 60 feet
Then 126 degrees for 45 feet
Then 245 degrees for 61 feet
Destination Point No. 17

Starting Point No. 13
Go 333 degrees for 60 feet
Then 154 degrees for 30 feet
Then 204 degrees for 17 feet
Destination Point No. 20

Starting Point No. 14
Go 78 degrees for 45 feet
Then 352 degrees for f42 feet
Then 210 degrees for 63 feet
Destination Point No. 11

Starting Point No. 15
Go 53 degrees for 54 feet
Then 272 degrees for 36 feet
Then 180 degrees for 38 feet
Destination Point No. 12

Starting Point No. 16
Go 357 degrees for 45 feet
Then 90 degrees for 30 feet
Then 216 degrees for 53 feet
Destination Point. No. 14

Starting Point No. 17
Go 72 degrees for 45 feet
Then 320 degrees for 30 feet
Then 195 degrees for 45 feet
Destination Point No. 13

Starting Point No. 18
Go 7 degrees for 60 feet
Then 114 degrees for 48 feet
Then 217 degrees for 60 feet
Destination Point No. 12

Starting Point No. 19
Go 85 degrees for 75 feet
Then 287 degrees for 60 feet
Then 200 degrees for 29 feet
Destination Point No. 16

Starting Point No. 20
Go 69 degrees for 45 feet
Then 317 degrees for 60 feet
Then 178 degrees for 63 feet
Destination Point No. 19

CRUISING THE CLEARCUT

Focus To use the skills from Activity "Tall Timber" and other mathematical operations to determine the number of marketable board feet in a particular tree

Group Size Small groups of 2-4

Time Required 30 minutes

Materials Tape measure and worksheet with board feet volume table

Physical Setting Any outdoors area with trees whose diameter at the base is at least 12 inches. Larger diameter trees are better.

Process

1. Measure the circumference of the tree and divide that measure by approximately 3 to get the diameter of the tree at breast height.

2. Take a sighting up a tree to where you think the tree narrows to an 8 inch diameter.

3. The student needs to determine height of the tree from breast height above the ground, to where the tree narrows to an 8 inch diameter.

4. Use the method from the activity "Tall Trees" to determine the number of feet from breast height to the 8 inch diameter. This activity uses a similar triangle and a stick that is the same length as the student's arm.

5. Once you know the height of the tree from breast height to a point where it is 8 inches in diameter, divide that height by 16 to get the number of sawmill log lengths.

6. Using the adapted Board Foot Volume Table (approximately 1965) (USDA) for second growth D>F.-Bul. 201, Table 13, determine the number of marketable board feet in the tree.

BOARD FOOT VOLUME TABLE

Height of mercantable tree number of 16 foot logs

Diameter in inches	1		2	3	4	5	6	7	8
12	62		80	133	183	235	286		
14	64		88	147	210	274	338		
16	67		96	163	242	320	399		
18	71		109	190	280	370	459	550	701
20	75		123	221	330	435	543	651	758
22				258	383	509	633	760	884
24					438	584	728	882	1035
26						666	832	1013	1190
28						750	941	1114	1346
30						850	1062	1291	1518
32							1195	1449	1700
34							1333	1614	1898
36							1494	1782	2095
38								1955	2305
40								2150	2523

When logs are sawed into boards, they are measured in board feet. A board foot is a board that is 12 inches wide by 12 inches long by 1 inch thick. To use the table above you need to find how tall a tree is from breast height to where you estimate the diameter narrows to 8 inches. Use the activity "Tall Trees" to help you find this number. You also need the diameter of the tree. The work sheet below will help you get these figures.

WORKSHEET:

Height of tree to 8 inch level: Number of steps x length of step = height of tree

_____ x _____ = _____

Number of Saw Logs: Height divided by sixteen = number of sawlogs

_____ / 16 = _____

Diameter of tree: Measure around tree divided by 3 = diameter of tree

_____ / 3 = _____

Board Feet: Find the diameter of your tree in the left column of the chart.
Find the number of sawlogs reading across the top of the chart.
Where the column and the row cross you will find the number of board feet in your tree.

Marketable board feet in my tree is:_____

IF each board foot of finished lumber is worth 45¢ at the lumber store, how much is your tree worth?

My tree is worth $_____.

BEST COPY AVAILABLE

A DIFFERENT SLANT ON SLOPE

Focus To determine the slope of different soil areas and what factors affect erosion on a sloped surface.

Group Size Small groups of 3-4

Time Required Depends upon the amount of land to be covered; in a school yard 15-20 minutes should be adequate

Materials

Recording sheet	50 inch stick
Yard stick	Level or a protractor

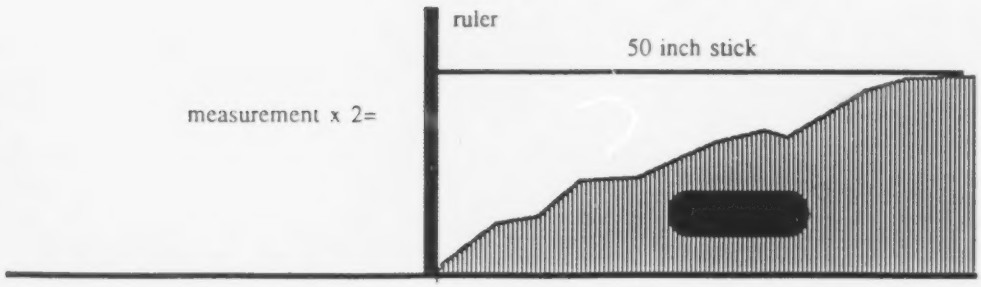
Physical Setting School yard or outdoor school

Process *Students will determine the slope of a soil surface using a 50 inch stick with either a small carpenter's level or a protractor attached.*

1. Rest one end of the stick on the uphill slope, position the stick so that it is level horizontally either with a level or by hanging a weight down on a string at a 90 degree angle to the stick.

2. Measure the distance from the downhill end of the stick to the ground in inches. Multiply that number by 2 (you are using a 50 inch stick instead of a 100 inch stick) and express your result as a percent (%).

Example: a 21 inch drop from the downhill end of the stick to the ground equals 41% slope. 21 x 2 = 41



DIVERSE DIVERSITY

Focus To develop an understanding of the importance of biodiversity and the three different branches within it.

Group Size Entire class

Time Required 1 to 1.5 hours

Materials Definition sheet *(3 copies)*
Question sheet (*teacher's use*)

Physical Setting Indoors or outdoors

Process 1. Divide the students into three groups. Pass out one definition sheet to each group. Go over the definitions with the students, making sure they understand the differences in the terms. Assign each group to one term, and have them develop a unique presentation consisting of: characteristics that fit into their category, importance of diversity within it, and the relationship to the other categories. ENCOURAGE CREATIVITY!!! Fifteen minutes for preparation should be allowed and five minutes for each presentation. After all three presentations are completed, refer to the question sheet and encourage discussion.

Definitions of Diversity

BIODIVERSITY- the variety of living organisms and the ecosystems and ecological processes of which they are parts.

GENETIC DIVERSITY- refers to the variety of genes within a species. Example: difference of tree size within a species.

SPECIES DIVERSITY- refers to variety of species within a region.

ECOSYSTEM DIVERSITY- refers to the variety of habitats, biotic communities, and ecological processes within a biosphere.

QUESTIONS FOR DISCUSSION

For instructor's use

1. What is the importance of biodiversity for humans?
possible answers: food, medicines, industrial products, water purification, nutrient cycling, pollination

2. What is the importance of biodiversity for other species?
possible answers: Many species depend on each other for survival.
The absence of one species has great impact within the "web of life."

3. How do you think the loss of ecosystem diversity affects the species diversity and genetic diversity?
possible answers: Habitat provides space for the diversity of species and genetics to exist in a natural way.

4. What do you think some causes of biodiversity loss are?
possible answers: deforestation, population growth, habitat fragmentation, pollution, invasion of introduced species, overexploitation, climate change

5. What can you do to have a positive impact within biodiversity?

FEDEX THAT PACKING MATERIAL BACK TO NATURE

Focus Investigating whether the so-called biodegradable packing materials is truly biodegradable and environmentally friendly.

Group Size Entire class

Time Required Several weeks

Materials Biodegradable packing material: "styrofoam" made from corn starch or potato starch. (*Many technological industries use this "popcorn" packing material in shipping their products.*)

Physical Setting Classroom window sill or greenhouse, if available

Process

1. Dissolve the cornstarch "styrofoam" in water. Plant some bean seeds or other seeds in 6 different pots with potting soil.

2. Record the date and how many seeds were planted in each pot.

3. Water 3 of these pots with tap water and the other 3 with the "styro-water."

Keep a record :

1. Did all of the seeds planted in all of the pots germinate?

2. Did all of the pots have the same number of seeds germinate?

3. Did all of the pots have seeds germinate on the same date; both those with regular water and those with "styro-water"?

4. Did all of the plants grow to be the same height when you compare different pots that were watered the same?

6. Did all of the plants grow to be the same height when you compare different pots that were watered with regular water vs. "styro-water"?

Conclusions: Is the new "biodegradable styrofoam" eco-friendly? Your reasons for your answer need to be given.

HEART TO HEART

Focus To help students learn more about their circulatory system and how it relates to daily activity.

Group Size Entire class

Time Required 30-45 minutes

Materials A watch with a second hand.
Heart worksheet
Writing utensil

Physical Setting Angel Falls or Covel Creek Trails

Process

1. Facilitator leads discussion about the heart and its role during everyday activities. Discuss its functions and jobs.(Oxygen and Carbon Dioxide transport) Talk about when and why the heart speeds up and pumps faster and when the heart slows down and beats slower.

2. Teach students what their pulse is and how to find it.(both neck and wrist) Have students take pulse for six seconds and then multiply that number by ten. This is their beats per minute (bpm). Explain to them if they want to find their resting heart rate they need to take their heart rate immediately after waking up.

3. Have students lie down and take pulse after a few minutes. Discuss with students why their hearts have slowed down.

4. Go for a short hike, one with incline. Angel Falls or Covel Creek work best. After five or ten minutes of heavy hiking, take pulse once again. Discuss why their hearts have sped up.

Discussion

1. What are other effects hiking has on the body?

2. What is the importance of exercise to maintaining good health?

3. Name three forms of aerobic exercise.

Extension

Investigate other important systems used when hiking- -the skeletal system, the muscular system.

HEART WORKSHEET

Figuring Your Heart Rate

1. What's the largest muscle in your body?_____

2. Your heart transports_____ to the cells in your body and transports_____ away from your cells.

3. Diagram this picture of the heart

Finding Your Pulse

To find your pulse place both your index and middle finger on your wrist. Do not use your thumb because it has its own pulse which will be indistinguishable. If you cannot feel your pulse in your wrist, place fingers on the carotid artery on the side of your neck.

*bpm is short for **B**eats **P**er **M**inute

Pulse at rest (6 seconds) _____ x10 _____ = bpm
Pulse lying down (6 seconds) _____ x10 _____ = bpm
Pulse when hiking (6 seconds) _____ x10 _____ = bpm

3. Why is it important to raise your heartbeat and to increase physical activity?

4. Name three forms of exercise.

5. When one hikes or performs strenuous activity, the body shows physical or visual effects, name some.

Instructor's Discussion Information

The Heart

The heart is a cone shaped pump which is the primary element of the circulatory system. The cardiovascular system efficiently transports oxygen and nutrients to body tissues and transports accumulated waste substances away from the tissues. The large muscle contracts over 100,000 times a day. Each heartbeat pumps about two ounces of blood resulting in the pumping of 13,000 quarts a day. The harder the heart works, the more efficient it becomes. That is why exercise gets easier the more you do while additionally increasing your cardiovascular capacity. Cardiovascular capacity is defined as the efficiency that your heart works at to provide oxygen to tissues.

One way to measure one's cardiac capacity is to monitor one's pulse or heart rate. To get a basis of measurement, take your resting heart rate. This is the number of heart beats you have in a minute right after waking-up. The lower your resting heart rate, the healthier your heart is. To decrease your resting heart rate, you need to know your maximum training heart rate. Your training heart rate is the ideal number of B.P.M. to maximize exercise benefits based on your current physical fitness and age. Below is the formula to calculate it.

220 - Age = Maximum Heart Rate

(220 - Age) X 75% = Training Heart Rate

When you continue to exercise at your calculated training rate, you will see your resting heart rate decrease over time.

Discussion

Visible effects of Strenuous Cardiovascular Activity

1. Sore Muscles

Sore muscles are due to the build-up of lactic acid in the muscles as a product of anaerobic respiration. Respiration is defined as the cellular process by which energy is released from nutrients. Anaerobic respiration results when the body can no longer carry on aerobic respiration because the circulatory system cannot supply oxygen efficiently enough to meet the needs of aerobic respiration. Aerobic respiration is defined as the phase of cellular respiration that requires the presence of oxygen where anaerobic respiration is the phase of cellular respiration that occurs in the absence of oxygen.

2. Sweat

Sweat, a liquid composed mostly of water and small quantities of salts and certain wastes (urea and uric waste), is produced by the eccrine glands. They respond primarily to elevated body temperature, especially due to physical activity. Sweating helps the body maintain a constant body temperature of 98.7 F (37 C). As sweat evaporates from the body, it carries heat away from the surface.

3. Energy Consumption

Energy spent on a hike can be measured by calculated caloric expenditure. A calorie is a measurement of energy. The amount of potential energy in food can be expressed in calories.

Here are the caloric contents of some common foods eaten by kids. Try to figure out how long certain activities need to be done to "burn off" certain foods.

Food used/hr.	Calories	Activity	Calories used/hr.
Candy Bar	250	Angel Falls hike	450
Coke	144	Covel Creek hike	200
1 c. pudding	322	Sitting at Rest	100
1 slice pizza	157		
1 c. peanuts	838		

HOT OR COLD
WET OR DRY

Focus

To use the daily and averaged temperature and precipitation recordings displayed on graphs in the hall of the education building to assist groups making their own weather predictions and to study local patterns.

Group Size

Up to 20 students

Time Required

20 minutes, plus time for individual calculations, if desired

Materials

Paper and pencil, or calculators

Physical Setting

In the hallway of the Cispus Education building

Process

1. Informally assess the group's familiarity with reading bar and line graphs. Instruct and pair students as necessary.

2. Study and extract information from the posted monthly graphs: highest and lowest monthly TEMPERATURES, largest and smallest daily spans, how many days above, below or at a given temperature--or within a range of 10 degrees. How many days with no measurable PRECIPITATION? Wettest days? How many at or under .50 inches? Between .50 and one inch? Etc.

3. Study the ten year temperature graph noting the curve, high-low ranges, etc.

4. Study the ten year precipitation graph. Discuss its construction of color-coded bars and dots for averages. Extract information from it similar to that listed above.

5. Focus on the month of your attendance at Cispus noting patterns and exceptions. Make a list of probable weather conditions for your stay or compare how the weather during your stay has been typical or different than what you expected.

6. Incorporate this information into further studies and records you may keep if you use the weather station.

HOT WORDS FOR KOOL KIDS

Focus To give students the understanding they need of geologic terms, time and a connection to the sites of concern, before they go to an interpretive site such as Mt. St. Helens Interpretive Center at Silver Lake or Coldwater Lake and before they travel from Cispus to Mt. St. Helens Volcanic Monument.

Group Size Entire class

Time Required 20 minutes

Materials Duplicated word puzzle (crossword, word find, etc.)
Handout: ***Volcanic Vocabulary Definitions***
(modification of a USGS "Glossary of Volcanic and Related Terms" obtained from the Interpretive Center at Silver Lake.)
Crossword Key
Crossword Layout

Physical Setting Classroom at school

Process Students will use references (such as science text, environmental guide, Glossary of volcanic and related terms, and other) to match the clues with the terms.

Volcanic Vocabulary Definitions

Active Volcano	A volcano that is erupting, or has erupted within the last 10,000 years, and is likely to erupt again.
Ash	Fine particles of powered rock shot out from a volcano when it erupts.
Basalt	A type of lava which is very dark, almost black in color.
Caldera	A basin-shaped depression that usually is caused by the subsiding of a volcano's top and is usually filled with water.
Cinder cone	A volcanic cone built entirely of loose fragments of lava, pumice and ash.
Crater	A steep-sided circular depression formed when a volcano's top explodes or collapses.
Dome	A steep-sided mass of thick lava pushed up in the middle of a crater. It is usually circular with a rounded or flat top.
Dormant volcano	A volcano which is not currently active, but may be in the future.
Extinct volcano	A volcano that is not presently erupting and is not likely to erupt in the future.
Eruption	The process where ash, gases, and liquid rock are shot up into the air or spilled out on the surface of the Earth.
Fault	A crack in the Earth's surface, especially where two or more plates come together.

Fissure	A long crack on the slope of a volcano. Often gases and lava can come out of these cracks as well as out of the crater
Fumarole	A vent or opening where steam, and other gases come out of a volcano (active or dormant).
Lahar	A huge mud flow from a combination of ash, water, and other volcanic materials.
Lava	Magma that has reached the surface.
Magma	Melted rock beneath the surface of the Earth
Magnitude	A number that expresses the size of an earthquake. Each number is 10 times stronger that the number below it. Example a 4 is 10 stronger than a 3.
Pumice	Light- colored, frothy volcanic rock that floats.
Pyroclastic flow	A mixture of rock, ash and hot gases which flow very rapidly (50 to 100 miles per hour) down a volcano's sides during an eruption .
Shield Volcano	A broad, very gently sloping volcano bulge created almost entirely of lava flows. It is named for the shape: like a warrior's shield laid flat.
Stratovolcano	A volcano composed of both lava flows and loose pyroclastic rocks.
Vulcan	The Roman god of fire and the forge, after whom volcanos are named.

Crossword Key

Across

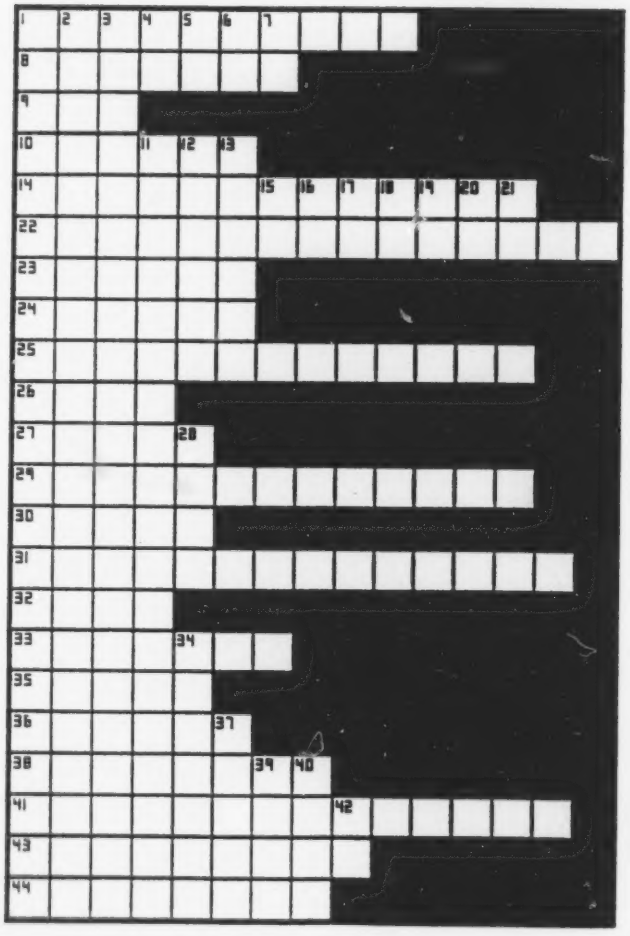
1. A volcanic cone built entirely of loose, fragmented material
8. A large, basin-shaped volcanic depression caused when a volcano subsides, usually filled with water
9. Fine particles of pulverized rock blown from an exploding volcano
10. A steep-sided, usually circular, depression formed by either an explosion or a collapse of the top of the volcano
14. A volcano composed of both lava flows and pyroclastic materials
22. A mixture of rock, ash and hot gases that move rapidly down the volcano's slopes
23. The Roman god of fire and the forge
24. A type of lava that is almost black
25. A broad, gently shield-shaped volcano
26. A steep-sided mass of thick lava pushed up in the middle of a crater, usually round with rounded or flat top.
27. A crack in the Earth's surface, especially near the plate borders
29. A volcano which is erupting, or has erupted in the past 10,000 years, and will erupt in the future
30. A mud flow down the slopes of a volcano made up of water, ash and lava fragments
31. A volcano which is not erupting and is not expected to erupt in the future
32. Melted rock which has come out on the surface of the Earth
33. A large crack in the slope of a volcano; lava and gases come out of these cracks
35. Melted rock below the surface of the Earth
36. Light, frothy rock that can float on water
38. The process of ash, gases and liquid rock being shot out of a volcano
41. A volcano that is not erupting now, but is expected ot in the future
43. A number that stands for the strength of an earthquake
44. A vent or opening in an active or dormant volcano that has steam and other gases escaping

Down

19.
20.
21.
28.
34.
37.
39.
40.
42.

VP22

Crossword Layout



LOOKING OUT YOUR WINDOW

(Urban/non-urban environments part 1)

Focus

To define an urban environment using observation and sketches of their environment, and journal writing with a field study emphasis.

Group Size

Entire class

Time Required

1 hour

Materials

Pencil	Journal	Clipboard
Paper	Markers	Chart paper

Physical Setting

Classroom and outside of classroom or school building

Process

1. While the students are sitting at their desks, have them look out the classroom window and draw or sketch what they see. (10 minutes)

2. After the sketching, have the students write what they observed into their journals. (5-10 minutes)

3. After the students have completed the journal writing, have the students get with a partner and share what they observed - show their sketching and share their journal entries. (5 minutes)

4. Have students share with the entire class the types of things they observed (teacher will write down on chart paper all ideas that have been shared and keep the chart paper posted in the classroom).

5. After filling the chart, ask the class the following questions:
   a). Did you feel like you observed as many things as you should have?
   b). Are their specific skills needed for observations or field studies? If so, what skills?
   c). If we were to do this activity again, do you think you could improve your sketching or journals by being more detailed?

6. The chart and class discussion should take approximately 15 minutes.

VP24

7. Have the students take out another sheet of paper and as a class go outside of the classroom or school building to find a place where the students can sit down to sketch and write in their journals about what type of environment they see.

8. After this observation, repeat steps 2, 3, and 4.

9. After filling the chart, ask the following questions:
   a). Were your sketches or writing more detailed this time?
   b). Did you feel that you had improved on your observation skills (how/why)?
   c). What is an environment?

Closure:

1. After the discussion, the teacher will explain that our environment is basically our surroundings - anything around us is considered our environment.
2. Students will then give examples of environments (school, home, work, are all examples of types of environments that we as humans live in).

LEARNING ABOUT YOUR HABITAT
(Urban/non-urban environments part 2)

Focus To learn the similarities and differences between a habitat and an environment. To be able to explain the key components of human habitats and their survival needs.

Group Size Entire class

Time Required 1 hour

Materials Chart paper Field study journals Paper
Pencils Markers

Physical Setting Home (*inside & outside of bedroom*), and classroom

Process

1. Assign the following lesson as homework:
Have students look out their bedroom window and sketch what type of environment they see.

2. After the sketching, have the students write what they observed into their field study journals. Have students repeat steps 2 and 3, observing the inside of their bedroom.

3. Have students bring all home observation data to school the next day.

4. The next day, have students partner up and share their observational data (sketchings & field study journals).

5. Have students share with the entire class the types of things they observed. Teacher will write down on chart paper all ideas that have been shared and keep the chart paper posted in the classroom.

6. After the chart, ask the class the following questions:
   a). What were some of the similarities between your school and home environments?
   b). What were some of the differences?
   c). Are they both considered environments?

7. The teacher will again emphasize that an environment is your surroundings, but a habitat is where you actually live.

8. The teacher will have the students divide into cooperative groups of 4, give each group chart paper, and have each group draw a concept map showing what humans need in their habitat

in order to survive (example: air, water, transportation, shelter, food, etc.) Refer to lesson part 4 for an example of a concept map.

Closure:

1. Have each group present and display their concept maps.

2. The teacher will question each group about the major components that humans need in their habitats to survive, especially if a group is missing one of the key components - food, water, air , shelter, transportation, etc.)

PHOTOGRAPHIC FIELD OBSERVATIONS

(Urban/non-urban environments part 3)

Focus To create a photographic record of field observations in an urban habitat and review the meaning of habitats and environments.

Group Size Entire class

Time Required 30 minutes, class time
20 minutes, homework

Materials *Per student:*
One, 24 exposure, disposable camera with flash
Student observation sheets
Field study journals
Sketches
Concept map from part 2

Physical Setting Classroom and students' homes

Process

1. Review definitions of an urban environment and human habitat, referring to previously collected data: field studies, sketches, and students' concept maps of human survival needs (air, water, food, etc.).
2. On chart paper, students and teacher will generate a master list of human survival needs (air, water, food, etc.), and elements of a human habitat. Teacher should emphasize the diverse human homes across cultures, yet they serve the same purpose - providing shelter.
3. Distribute cameras and observation sheets.
4. Demonstrate how to use the camera and role play the process of choosing an item to photograph, writing a description of the item, and explaining how and/or why humans use the item for survival.
5. Students will go home and photograph 12 different items from their habitat that they feel are most important for human survival, writing the necessary information on the observation sheet.
6. The next morning, teacher will collect observation sheets and cameras (make sure all are labeled with students' names). Class will hold a brief discussion about their observations.

STUDENT OBSERVATION SHEET

Human Habitat

photo #1
Description of the item:

Explain how and/or why humans use the item for survival:

photo #2
Description of the item:

Explain how and/or why humans use the item for survival:

photo #3
Description of the item:

Explain how and/or why humans use the item for survival:

photo #4
Description of the item:

Explain how and/or why humans use the item for survival:

photo #5
Description of the item:

Explain how and/or why humans use the item for survival:

photo #6
Description of the item:

Explain how and/or why humans use the item for survival:

photo #7
Description of the item:

Explain how and/or why humans use the item for survival:

photo #8
Description of the item:

Explain how and/or why humans use the item for survival:

photo #9
Description of the item:

Explain how and/or why humans use the item for survival:

photo #10
Description of the item:

Explain how and/or why humans use the item for survival:

photo #11
Description of the item:

Explain how and/or why humans use the item for survival:

photo #12
Description of the item:

Explain how and/or why humans use the item for survival:

AT PEACE WITH NATURE
(Urban/non-urban environments part 4)

Focus To learn how to observe the forest environment and wildlife habitats using sketches and field study journals.

Group Size Entire class

Time Required 1 hour

Materials

Paper	Pencils	Clipboards
Chart paper	Markers	Field study journals

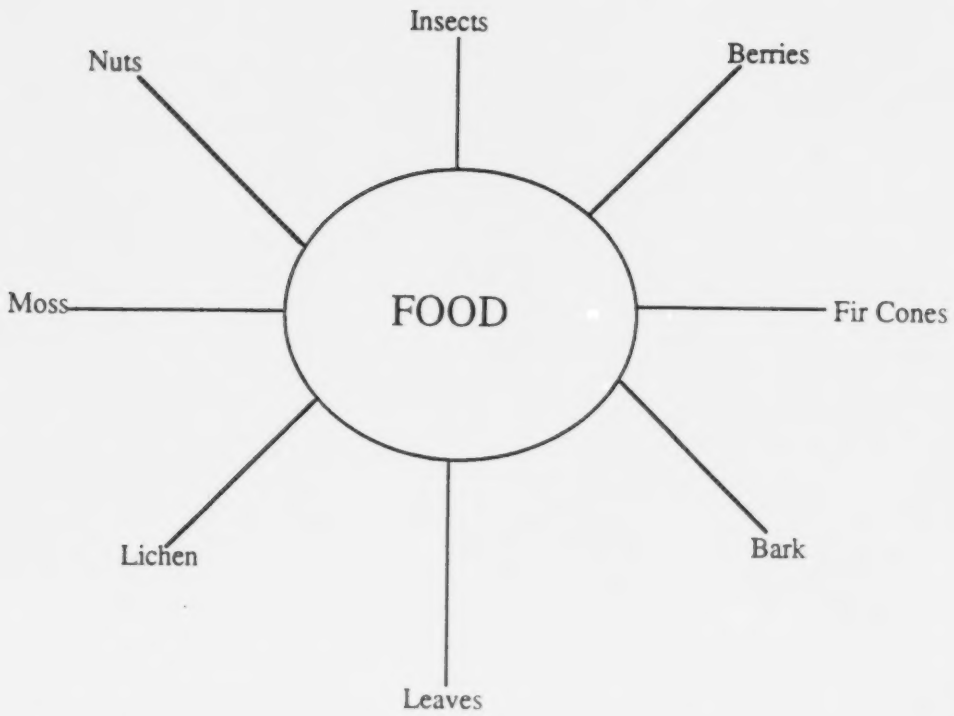
Physical Setting In the forest setting at Cispus.

Process

1. Review with the students the types of skills needed to collect valuable data during observations and field experiences. The Native Americans call these techniques "being at peace with nature," which means fitting in and not disturbing the environment with voices or movement.
2. Have students demonstrate around the campground area what the "sit and squat" method of observation looks like before going out in the woods to doing the field study (the "sit and squat" method is when students sit or squat next to a tree and pretend that they are a part of that environment or habitat).
3. After all students have a clear understanding of the "sit and squat" method of observation, the teacher, with the help of other supervision, will take the students into the forest environment.
4. The students will find a place in the forests to sit or squat down against a tree (trying to fit in or be at peace with nature) and make sketches and field study notes in their journal about their observations.
5. The actual "sit and squat" observation should be a minimum of 15-20 minutes in order for the students to truly feel like they have become a part of the forest, or feel at peace with nature.
6. After the "sit and squat" observation the students will return to the campground or classroom to discuss the experience.
7. Have the students divide into cooperative groups of 4 and brainstorm a concept map which demonstrates one of the key components needed for wildlife survival within a habitat (air, water, shelter, transportation, food, etc.)
8. Each group will pick one key component and give examples from their observations that demonstrate how they met the wildlife survival needs.

Closure:
Each group will give an oral presentation on their concept map and specifically cite data from their field study observation to support their findings.

Concept map example



PHOTOGRAPHIC FIELD OBSERVATION

(Urban/non-urban environments part 5)

Focus To create a photographic record of field observations in a non-urban habitat and review the meaning of habitats and environments.

Group Size Entire class

Time Required 1 hour

Materials

- Disposable student cameras from part 3
- Student observation sheets
- Markers
- Chart paper

Physical Setting Classroom and forest environment

Process

1. Review definitions of a non-urban (forest) environment and forest habitats, referring to field study journal, sketches, and students' concept map of wildlife survival needs (air, water, food, etc.) from part 4.

2. Distribute cameras and observation sheets.

3. Review how to use the camera and role play the process of choosing an item to photograph, writing a description of the item, explaining how it is a part of the forest habitat, and how wildlife uses the item for survival.

4. Students will go into the forest and photograph 12 different items from the habitat that they feel are used for wildlife survival, writing the necessary information on their observation sheets.

Closure:

1. Students return from forest and turn in cameras.

2. On chart paper teacher will write what students share about their photographs and descriptions.

3. Collect observation sheets.

STUDENT OBSERVATION SHEET

Forest Habitat

photo #13
Description of the item:

Explain how wildlife uses the item for survival:

photo #14
Description of the item:

Explain how wildlife uses the item for survival:

photo #15
Description of the item:

Explain how wildlife uses the item for survival:

photo #16
Description of the item:

Explain how wildlife uses the item for survival:

photo #17
Description of the item:

Explain how wildlife uses the item for survival:

photo #18
Description of the item:

Explain how wildlife uses the item for survival:

photo #19
Description of the item:

Explain how wildlife uses the item for survival:

photo #20
Description of the item:

Explain how wildlife uses the item for survival:

photo #21
Description of the item:

Explain how wildlife uses the item for survival:

photo #22
Description of the item:

Explain how wildlife uses the item for survival:

photo #23
Description of the item:

Explain how wildlife uses the item for survival:

photo #24
Description of the item:

Explain how wildlife uses the item for survival:

PHOTOGRAPHIC FIELD OBSERVATIONS REPORT

(Urban/non-urban environments part 6)

Focus To create a photographic record for field observations of urban and non-urban environments. Students will write a report demonstrating their understanding of the concept of environments and habitats, and how survival needs are met within them.

Group Size Entire class

Time Required 1 hour

Materials Writing paper Construction paper Pencils Glue
Per student:
Students' processed photographs
Completed observation sheets
All charts and concept maps
Student journals and sketches from previous assignments
3-ring binder

Physical Setting Classroom

Process

1. Students arrange photographs in book formation construction paper, with a written description of each item from the observation sheets.

2. Using all collected data (journals, sketches, observation sheets, photographs, concept maps, and charts) students will write a report containing the following information:
a) Describe in detail your environment and your habitat. How does it meet your human survival needs?
b) Describe in detail the forest environment and some of the habitats you observed. How does the forest environment meet the survival needs of wildlife?
c) How are these two environments similar? How are they different?
d) How have humans changed the natural environment (like the forest) to make it a suitable habitat for their survival?

3. Place the report, photographs, journal entries, and sketches in a 3-ring binder and turn in for evaluation.

MAKE MONEY, MAKE CARDS!

(This lesson could be used as a fundraiser for camp)

Focus To research and report on Northwest Wildlife, and use facts and illustrations from their research to make gift cards on stationary paper.

Group Size Entire class

Time Required 1 hour , or more

Materials Quality or stationery paper Lead and colored pencils
Envelopes Pens
Cispus Teachers' Guide to Northwest Mammals *(available at the Cispus office,* or other resource materials

Physical Setting Classroom

Process

1. This project should be completed at school before students go to camp.

2. The teacher will discuss with class the following questions:
   a). What are the major components of a mini-report?
   b). What types of facts about wildlife would be important to include in a mini-report (their habitat, food, description or characteristics, etc.)?

3. Have students refer to the Cispus Teachers' Guide to Northwest Mammals and turn to page 1. Have the students read and discuss what would be 3 to 4 important or interesting facts to include in a mini-report about the Black Bear.

4. After the class discussion, the teacher would demonstrate what their final project (gift cards) would look like (the teacher would show completed gift card on the Black Bear). This card would have an illustration on the front cover of a Black Bear and four interesting facts handwritten under the illustration.

5. The teacher would then have students divide into cooperative groups of four and assign each group a specific mammal from the guide. Each member of the group would be responsible for picking and writing one interesting or important fact about their mammal.

6. After each member in each group has completed this task, each member of the group would share their fact with the other members of the group. Each member would be responsible for writing down all other facts.

7. Teacher would consult with each group about their facts, and if satisfied, would give each member the quality stationary paper to start making their card. (The teacher would demonstrate how to make the card: fold paper in half, write toward the bottom of the front cover your four facts, use the rest of the front cover to make an illustration of the animal, and on the back cover of the card write handmade by : NAME; include your name, grade, and school).

8. After each group has completed their cards, have the groups present them to the class.

9. After the groups have presented their cards to the class, assign each individual to complete four additional cards. Each card should have an illustration with 3-4 facts handwritten below the illustration. The students will also be responsible for choosing and completing four different mammals.

10. After each individual has completed their five cards, have the students stack the five cards and envelopes together and use nice ribbon to tie a bow around the stack to make it look like nice stationery or gift cards.

11. This stationery could be sold as a fundraiser to support the students' environmental camp experience, or be used at camp to write a letter home to parents, grandparents, friends, etc.

MAPPING MT. ST. HELENS INTERPRETIVE CENTER

Focus To be used a directional assistance for students answering the questions to ***"There's A Lot Of Shaking Going On!"***

Group Size 1-30 students

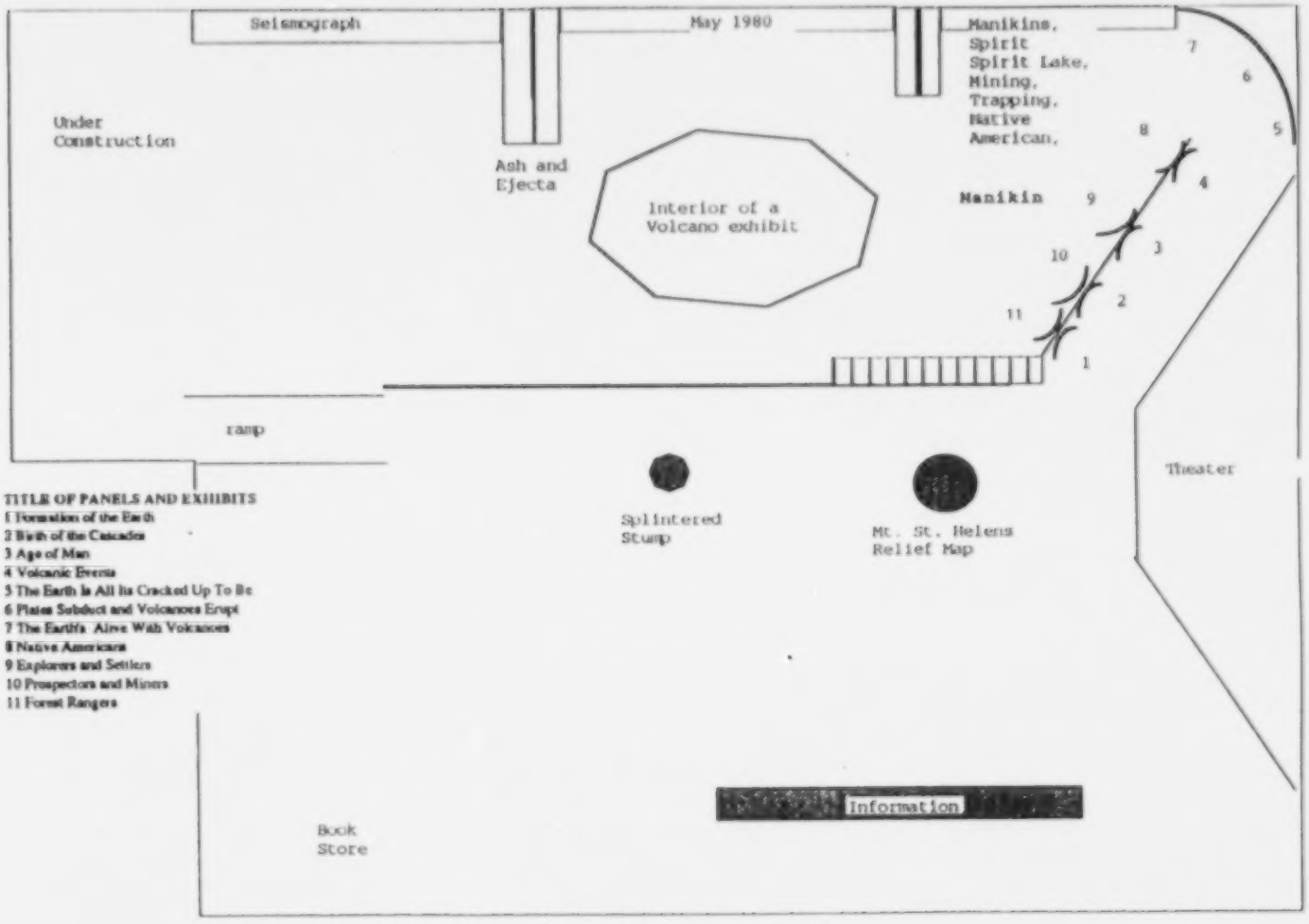
Time Required 5-20 minutes

Materials Handout: ***Mapped Guide to Mt. St. Helens Interpretive Center***

Physical Setting Mt. St. Helens Interpretive Center or classroom

Process This map may be used as a simple help for doing the questions associated with the Activity: "There's A Lot of Shaking Going On!" or you could write map study questions to go directly with the map.

Guide to Mt. St. Helens Interpretive Center



VP40

BEST COPY AVAILABLE

MT. ST. HELENS FOLLOW-UP

Focus

To follow-up and apply the concepts that the students learned at camp Cispus about Mt. St. Helens and geology. *To be applied after the students have taken an all day field trip to Mt. St. Helens to learn more about its history and the eruption.*

Group Size

Entire class

Time Required

10-12 hour trip (*The trip begins and ends in Tacoma*)

Materials

Sack lunch	Snacks	Approx. $3.50 for dinner
Paper	Pencils	Clipboards

Field Study Journals, or other reference materials that were used with the students at camp in regards to Mt. St.. Helens (students' camp book, journal, handouts, etc.).

Physical Setting

Mount St. Helens Visitor Center (near Castle Rock, WA.), Yale Reservoir, Lahar, Lava Canyon, The Ape Caves, and The Trail of Two Forests.

Process

1. Teacher would need to reserve a bus for the entire trip.
2. Students would meet at school on a Friday morning at 7:30 a.m. Depart school by 7:45 a.m.
3. The bus would arrive at the Mount St. Helens Visitor Center at approximately 9:30-9:45 a.m. Students would unload the bus and have approximately 1/2 hour to wander around and observe the visitors center until the first movie or presentation would begin.
4. Students would then go into the theater to watch the movies about the May 18th eruption in 1980 and the history of Mt. St. Helens. This takes approximately 45 minutes.
5. After the presentation, the students will divide into cooperative groups of four and, with their questionnaire and map, go around to the different exhibits to try to find the questionnaire answers. (Refer to the following lessons in The Cispus Experience Encore: "There is a lot of Shaking Going On," and "Mapping Mt. St. Helen's Interpretive Center.") Give students approximately 30 minutes to work on questions.
6. Have students load bus and head to the Yale Reservoir for a picnic lunch from approximately 11:45 -12:30 p.m. (This is a great place to let your students spread out and enjoy nature and the scenic views.
7. After lunch, load bus and depart for the Lahar and Lava Canyon. After arriving have the students hike down to view the spectacular waterfalls that were created from ancient lava flows. At the end of the trail is a place where students can safely sit to observe the canyon. Have students sketch or write in their field

study journal what they are observing and what questions they have about this area. (This is a great way to lead into mini-reports back at school.)

8. Load bus and depart for the Ape Caves. Give the students approximately 1 hour to go into the Ape Caves in small groups of 4-5 with an adult. After exploring the cave, discuss with the group what the experience was like. Then, it's back to the bus to write what they observed into their field study journals.

9. Last stop is The Trail of Two Forest. Before entering the trail have the same cooperative groups meet with their leader and discuss the following questions:

a). Why do you think the trail is called The Trail of Two Forests?

b). Do you really think there are two separate forests? Why or why not?

c). We know that some lava did flow through this area, so what kinds of things do you think we will be observing?

10. After group discussions, start groups one at a time on the trail, leaving some time in between each group (approximately 1-2 minutes). Make sure that groups stay together and with their leader to observe things together. At the end of the trail, have all groups wait until the entire class is at the famous Lava Tube Crawl. At this time each group will share how accurate their answers were to the questions before entering the trail.

11. Allow students one at a time (with plenty of space in between them) to crawl through the underground lava tube. Do not allow any students to go through the crawl without wearing long pants, because it is very rough, hard, solid rock inside the crawl. (This activity is approximately 1 hour)

12. After The Trail of Two Forests, have students load the bus and on the way home write down in their field study journals what they observed at this site.

13. Depart for home at approximately 4:00 pm. (A good place to consider stopping for dinner is MacDonald's in Chehalis, because this gives the students an opportunity to have a break and enjoy eating at a restaurant with their classmates.)

Closure:

1. When students return to school on Monday, have them compile all of their notes and write a report about Mt. St. Helens including at least two sites that were visited.

2. One extension to this field trip is to give each group one disposable camera and have each member of the group responsible for taking 6 out of the 24 pictures. After the film is developed have the group put together a portfolio of their field trip. Each student would be responsible for mounting their pictures on construction paper and writing underneath of the picture the name of the place the picture was taken, name of the student, and 3-4 interesting facts about that place the picture was taken.

SEEING THE WEATHER SCENE

Focus To observe the results of weather along the trails and in open areas

Group Size Small group to entire class

Time Required 30 minutes to one hour or more

Materials *Optional:*
Paper and pencil for notes
Drawing paper and supplies for follow-up activity

Physical Setting Begin indoors, or outside in an open area:
Outdoor hiking trails
River and stream banks along trails
Meadow and low open areas

Process

1. Start with a discussion of visible results of weather: tree limbs blown down, whole trees uprooted by rain, streambanks showing signs of erosion, trees growing with branches to one side, etc.

2. Take a "weather scenes" hike or incorporate seeing weather signs into a hike up to Angel Falls, Yellow Jacket Ponds, etc. Stop to discuss and speculate on the weather conditions that caused the "scene".

Follow-up:
At an area large enough to accommodate the group, like the benches along the Forest Loop Trail, where evidence of weather activity can be seen or speculated upon, do a split-paper drawing of befores and afters. What was this area like before the flooding, and what is it like now? What was it like before and after heavy rains, windstorm, drought, or snow melt? How would a particular portion of the scene look before and after any of these events?

TALL TIMBER

Focus To use mathematics in determining the height of a tree.

Group Size Small group of 2-3 students

Time Required 30 minutes

Materials A meter or yard stick (*optional, 100 foot tape measure*)

Physical Setting School yard or other outdoors area with tall trees

Process

Each group needs a stick that is the same length as the distance from the student's hand to their eye.

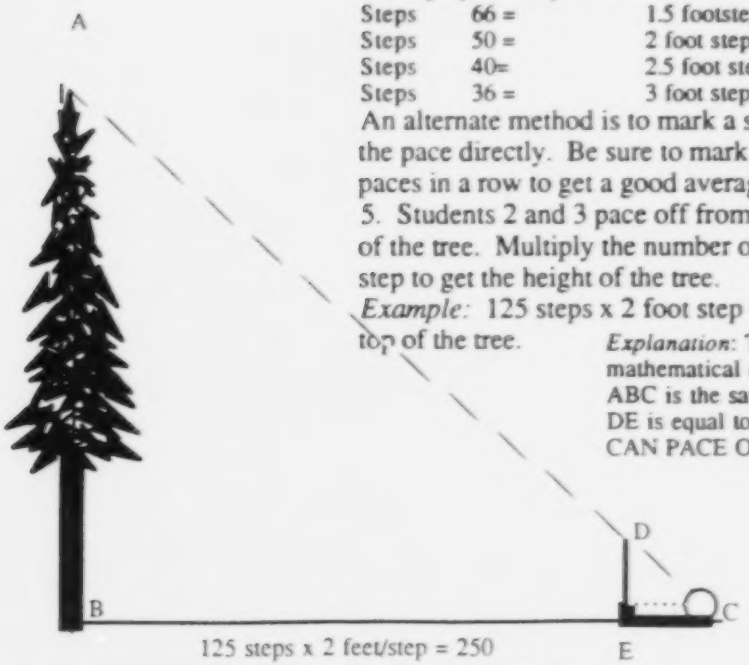
1. Student 1: Hold the stick at a point so that the length above your hand is equal to the distance to your eye.
2. Then, hold the stick so that it makes a right angle (90 degrees) with your arm.
3. Now, sight with your eye to line up the top of the stick with the top of the tree. You will need to backup or walk forward until the top of the stick is even with the top of the tree. Mark that spot on the ground with a stake or piece of paper.
4. Students 2 and 3: meanwhile, will pace off, counting their steps, for the length of a 100 foot tape. If you end up with about 66 steps your steps are 1.5 feet long

Steps	66 =	1.5 footsteps
Steps	50 =	2 foot steps
Steps	40=	2.5 foot steps
Steps	36 =	3 foot steps.

An alternate method is to mark a student's paces and measure the pace directly. Be sure to mark and then measure several paces in a row to get a good average measure.

5. Students 2 and 3 pace off from student 1's mark to the base of the tree. Multiply the number of steps times the length of the step to get the height of the tree.

Example: 125 steps x 2 foot step = 250 feet from the base to the top of the tree.



Explanation: The students are to use the mathematical concept of similar triangles. Triangle ABC is the same shape as DEC. This means that if DE is equal to EC, then AB is equal to BC. IF WE CAN PACE OFF BC, THEN WE ALSO KNOW

VP44

THERE'S A LOT OF SHAKING GOING ON!

Focus To give students questions to use during their visit to Mt. St. Helens Interpretive Center. These questions will help students get the most out of their time at the center and turn it into a learning experience, not just a sight-seeing trip.

Group Size Entire Classroom, or larger

Time Required 1-2 hours (*including the slide show or movie at Silver Lake*)

Materials Handout: ***Mt. St. Helens Interpretive Center Questions***

Physical Setting Mt. St. Helens Intrepretive Center at Silver Lake. The lesson could be modified to fit another center such as Coldwater Ridge Interpretive Center.

Process Students arrive at the Mt. St. Helens Intrepretive Center. They work in groups of 4-5 students with an adult and circulate through the center. The questions are tied to panel displays or exhibits; all of which have titles. The students are to write answers to the questions. Not all students will finish all of the questions; so it is important that answers are shared within their classroom when they return to school.

The slide show is 10 minutes and the movie is less than 30 minutes in length. A school may elect to have the students view one or the other but not both. This affords students enough time to answer most of the questions.

NAME _____

Mt. St. Helens Interpretive Center Questions:

Instructions: Use the map of the Mt. St. Helens Interpretive Center to locate the panels that go with each question. Example: The answers to the questions in the section "FORMATION OF THE EARTH" will be found on Panel 1: "FORMATION OF THE EARTH"

1. MT. ST. HELENS RELIEF MAP (*across from the information desk*):

1a. Find these locations on the Mt. St. Helens Relief Map:

a) Spirit Lake	d) Ape Caves	g) Merrill Lake
b) Lahar	e) Coldwater Lake	h) Green River
c) Meta Lake	f) Windy Ridge	i) Toutle River

2. MT. ST. HELENS FACTS: (*on the outside wall of the theater*)

2a. Mt. St. Helens was_____feet high before the eruption in 1980. It was _____feet high after the eruption.

2b. How much of the mountain's elevation was lost from the explosion during the 1980 eruption? *Show your work here.*

3. FORMATION OF THE EARTH

3a. Using this panel, what is the date span shown?

From _____B.C. to _____A.D. or B.C.

3b. What fact on the panel was most interesting to you?

4. AGES OF MAN

4a. How long ago did the first humans cross the Bering Straits to North America?

4b. On the AGES OF MAN panel which two NW volcanoes are shown erupting. What date did they erupt?

Name _____ Date _____

Name _____ Date _____

4c. Could there have been any people there to have seen the eruption?

NAME _____

5. THE EARTH IS ALL IT'S CRACK UP TO BE Exhibit

5a. In THE EARTH IS ALL IT'S CRACK UP TO BE Exhibit, when plates are in motion, what is happening?

Plates are _____

5b. From the information in this exhibit, how thick is the crust and how many miles is it from the crust to the center of the Earth?

Crust _____miles
Crust to Core _____miles

6. PLATES SUBDUCT AND VOLCANOES ERUPT

6 a. In this exhibit answer each of the 4 questions when you press each button.

Where do rocks melt?

What feeds the eruption?

Why do volcanoes erupt?

How do plates grow?

7. THE EARTH IS ALIVE WITH VOLCANOES exhibit

7a. Name 3 kinds of volcanoes.

_____

_____

_____

7b. What is an active volcano?

7c. Along what do volcanoes form and erupt ?

NAME _____

8. NATIVE AMERICANS

8a. On this panel, find the names of three Indian groups which lived around Mt. St. Helens.

_____

_____

_____

9. PROSPECTORS AND MINERS

9a. On this panel, what three (3) minerals were the prospectors and miners after?

9b. What minerals were mined from the Sweden Mine?

10. EXPLORERS AND SETTLERS

10a. On this panel, who named Mt. St. Helens?

10b. What year did the explorer get to the Northwest?

10c. From what country did he come?

10d. Mt. St. Helens was named after _____

a friend of _____.

NAME _____

11. FOREST RANGERS

11a. What year was the 1st Forest Service Guard Station built?

11b. What does CCC stand for?

11c. What year was the CCC started in the Mt. St. Helens area?

11d. What did the CCC do?

12. 1980 MT. ST. HELENS: DURING AND AFTER THE ERUPTION

12a When was the 1st earthquake on Mt. St. Helens in 1980? Give the day and month.

12b. When was the 1st eruption in 1980? Give the day and month.

12c. When was the big eruption in 1980? Give the day and month.

13 SPIRIT LAKE VIEWPOINT PHOTOS

13a Compare the 2 Spirit Lake Viewpoint photos that are on the side of the underground volcano exhibit. What is the most amazing thing that you see?

14. TREE RING DATES: (*inside the Underground Volcano exhibit*)

14a. There are 4 pictures of tree rings from trees from Lava beds, Smith Creek, Bear Meadow, and Spirit Lake areas. What do the narrow rings in the early 1480's tell us about growing conditions then?

14b What does 14a suggest happened in this area in 1480's?

NAME _____

15. ASHFALL, MAY 18, 1980

15a. How many cubic kilometers of ejecta came out of Mount Mazama in 4850 B.C.?

15b How many cubic kilometers of ejecta came out of Mt. St. Helens on May 18, 1980?

15c. What do you think the long term benefits to the N.W. from the Mt. St. Helens ashfall are?

16. SEISMOGRAPH

16a Which seismograph is hooked up to the floor? Try stamping your foot, (NOT TOO HARD) on the floor.

Left one Right one

16b Which seismograph is hooked up to Mt. St. Helens?

Left one Right one

16c Are there any recorded earthquakes on the seismograph today? Look at the Mt. St. Helens seismograph.

17. OTHER INTERESTING THINGS YOU FOUND AT MT. ST. HELENS INTERPRETIVE CENTER?

TIE DYE CAMP T-SHIRTS

Focus To tie dye a T-shirt to wear at camp.

Group Size 10 students with 2 adults/teachers

Time Required 1 hour (*plus set up, clean up, and next day rinsing*)

Materials

Rubber bands	String	Scissors	Rubber gloves
Old towels	Buckets	Salt	Fabric dyes
Plastic bags			
Fine tipped permanent marker		Needle-less syringes	

Per student:
Home washing directions
One prewashed T-shirt

Physical Setting Outdoors or inside, with the floor or ground covered with a large tarp. Two work stations - tieing, and dyeing.

Process

Preparation:

1. Prepare 2 work stations on tarp: one for soaking and folding clean shirts, and one with dye buckets, rubber gloves, syringes, and old towels for dyeing.
2. Fill one bucket with 1 or 2 gallons of warm water and add 1/4 cup of salt.
3. Prepare dyes in buckets according to package directions (RIT liquid works well). 4 buckets with 1/2 gallon of water each will dye 10-15 shirts. Make more if you plan on running more than one group through the activity.
4. Lay out towels around each dye bucket with one or two syringes and some rubber gloves.

Folding and tieing the shirts:

1. Write student's name in shirt with permanent marker.
2. Students dip shirts in salt water and wring out. They then find a place on the tarp to spread out their shirt and begin to fold or twist. It works well for students to work with a partner on one shirt at a time.
3. One popular method is to make a 2 in. fold, back and forth, accordion/fan style, on a diagonal across the shirt. Begin by folding a lower corner over about 2 in. to make a little triangle, then pick up the folded corner and lay it further up the shirt to create the diagonal accordion effect. Do not flip it over. Continue to pick up the ever increasing folded section of the shirt (this may require two people), and lay it on the next section up the shirt, without flipping it over. When it is finished, the student has

a long, skinny folded shirt. Tie pieces of string tightly at 2-5 in. intervals along the shirt.
4. Another method is to pinch and pull up the center of the shirt (front and back stuck together or just the front) and begin to tightly twist the shirt in one direction. Stop and put a rubber band or piece of string tightly around the twist every few inches until you reach the end of the shirt. You may vary this method by pinching and pulling from more than one place on the shirt, twisting and tieing for a while in one place, then moving to another.

Dyeing the shirts:
1. Students put on rubber gloves to work in dye area and lay shirt on a towel by the dye bucket.
2. Students use the syringe to gently squirt dye in desired places on the shirt. Avoid overlapping the colors too much as some dyes turn a muddy color when mixed together.
3. When finished, gently squeeze shirt as it lays on the towel. Excess dye will soak into towel.
4. Place the shirt in a plastic bag labeled with the student's name on masking tape and let sit overnight.

Next day rinsing:
1. The next day, students or adults rinse each shirt under cool water until water runs clear.
2. Continue to follow the included care instructions for the shirt in class, or put the shirt back in the plastic bag and send the following care instructions home with students:

CARE OF YOUR TIE-DYE SHIRT

This shirt has been dyed with fabric dye. A check next to each item number below indicates a step in the shirt-making process that has already been done. The steps not marked need to be completed at home. Enjoy your tie-dyed shirt!

__1.Twist, fold or knot wet shirt into pattern desired, apply dye.
__2.Place shirt in plastic bag for 24 hours, as is.
__3.Rinse shirt under cool tap water, until water runs clear.
__4.Soak shirt in white vinegar and water solution (1 cup vinegar to 1/2 gallon water) for at least 2 hours.
__5.Rinse again and unfold, or unknot, shirt.
__6.Machine wash with soap in cold water by itself and dry in dryer on high heat by itself (first time only)

CARE OF YOUR TIE-DYE SHIRT

This shirt has been dyed with fabric dye. A check next to each item number below indicates a step in the shirt-making process that has already been done. The steps not marked need to be completed at home. Enjoy your tie-dyed shirt!

__1.Twist, fold or knot wet shirt into pattern desired, apply dye.
__2.Place shirt in plastic bag for 24 hours, as is.
__3.Rinse shirt under cool tap water, until water runs clear.
__4.Soak shirt in white vinegar and water solution (1 cup vinegar to 1/2 gallon water) for at least 2 hours.
__5.Rinse again and unfold, or unknot, shirt.
__6.Machine wash with soap in cold water by itself and dry in dryer on high heat by itself (first time only)

VP52

WHEN I AM 21

Focus To observe evidence of plant and animal life on Windy Ridge, the effect of animals and plants on soil and water and predict the changes that can be expected over the next 10-year period.

Group Size Small group to entire class

Time Required 30-60 minutes for the climb and observations and an additional 10-30 minutes for the prediction phase

Materials Handout: ***Windy Ridge Observations***

Physical Setting Mt. St. Helens Volcanic Monument and perhaps a classroom at a later date.

Process

1. Have students climb the 300+ steps to the top of Windy Ridge.

2. Make observations and record them on the attached sheet.

3. Then, or later in a classroom, have them consider the changes that they perceived and predict what they think will happen within the next 10 years.

Windy Ridge Observation

WINDY RIDGE HABITAT: You have just climbed up over 300 steps from the parking lot to the top of Windy Ridge. As you catch your breath look around at the ground beneath your feet, Spirit Lake, down the sides of Windy Ridge, and across the volcanic plains to the crater. In the grid below fill in any observations that you make.

What plants, animals, soil and water do you see?

PLANTS:

DEAD, list them	LIVE, list them	DO you think that they are survivors of the 1980 blast? Why do you think that?

ANIMALS:

Dead, list them	Live, List them	Do you think that they are survivors of the 1980 blast? Why do you think that?

SOIL:

WHAT do you observe about the soil where you are standing? About all the soil visible from where you are standing?

WATER:

HOW much, or any, is located where you are? Where is water visible? Other

Now that you have gathered your observations together and have an idea what plants, animals, soil and water are here; keeping in mind that the eruption that created what you see happened May 18, 1980, and judging from what you see and remembering that the eruption wiped this ridge clean; what do you think this area will look like when you are 21 years old? Why do you think that these changes will take place?

Changes:

Why:

WILD WINDS AND RAINY RHYMES

Focus To observe current weather conditions and then make weather predictions using the Beaufort (BO fert) Scale and folk wisdom.

Group Size Small group to entire class

Time Required 30 minutes to 1 hour

Materials Compasses Weather rhymes
Writing materials (*for individuals or group*)
Handouts: ***Beaufort Scale***
Weather Rhymes

Physical Setting Outside in an open area (*weather permitting*)

Process

GROUP SHARING

Observations may be recorded and categorized later, or they may be discussed.

1. Describing today's weather, what do you see, hear, and feel? (feel the soft breeze/sharp wind on my face, see the wispy/billowing/white/dark clouds moving, hear the wind singing/whistling/roaring in trees)

2. Expand on ideas and brainstorm to create vivid descriptions.

3. STUDY BEAUFORT'S SCALE, label today's wind and discuss how it feels/felt to experience the wind in a variety of circumstances--weather during storms, in the outdoors when hiking, while boating or canoeing etc.

READ, RECITE, AND 'RITE weather rhymes.

WRITE a weather prediction rhyme to share at dinner.

FOLLOW-UP

1. Go to the weather station and read the instruments. Using the lesson "Weather Watching by the Chart", make a second prediction.

The Beaufort Scale

Scale Number	Name of Wind	MPH	What the Wind Does
0	Calm	0-1	Smoke goes straight up
1	Light air	1-3	Smoke is slightly bent
2	Light Breeze	4-7	Leaves rustle; wind vane moves
3	Gentle Breeze	8-12	Leaves and twigs in constant motion
4	Moderate Breeze	13-18	Raises dust and paper; moves small branches
5	Fresh Breeze	19-24	Small trees begin to sway
6	Strong Breeze	25-31	Large branches in motion
7	Moderate Gale	32-38	Whole trees sway; walking is difficult
8	Fresh Gale	39-46	Breaks twigs off trees
9	Strong Gale	47-54	Damages chimneys and roofs
10	Whole Gale	55-63	Trees uprooted (rare inland)
11	Storm	64-75	Widespread damage (very rare inland)
12	Hurricane	75 Above	Most destructive of all winds

RHYMES from WEATHER WISDOM

by Albert Lee, Doubleday and Company

Evening red, morning gray
Sets the traveler on his way;
Evening gray and morning red,
Brings down rain upon his head.

Evening red and weather fine,
Morning red, of rain's a sign.

If the sky beyond the clouds is blue,
Be glad, there is a picnic for you.

If wooly fleeces spread the heavenly way,
Be sure no rain disturbs the summer's day

A rainbow in the morning
Is the shepherd's warning;
A rainbow at night
Is the shepherd's delight.

Rainbow to the windward,
Foul fairs the day.
Rainbow to the leeward,
Damp runs away.

A summer fog for fair,
A winter fog for rain;
A fact most everywhere,
In valley and on plain.

When the dew is on the grass,
Rain will never come to pass.
When the grass is dry at morning light,
Look for rain before the night.

Sound traveling far and wide
A stormy day will betide.

A wind from the south,
Has rain in her mouth.

Winds that swing against the sun,
And winds that bring the rain are one.
Winds that swing round with the sun,
Keep the rainstorms on the run.

The winds of the daytime wrestle and fight
Longer and stronger than those of the night.

Red sky in the morning,
Sailors take warning;
Red sky at night,
Sailors delight.

If the sun goes pale to bed,
T'will rain tomorrow, it is said.

When clouds appear like rocks and towers
The earth's refreshed with frequent showers.

Rainbow in the eastern sky,
The morrow will be dry.
Rainbow in the west that gleams.
Rain falls in streams.

When the mist creeps up the hill
Fisher, out and try your skill;
When mist begins to nod,
Fisher then put up your rod.

When the forest murmurs and the mountain roars,
Then close your windows and shut your doors.

When the wind is from the east,
Neither good for man nor beast.

If the rains come before the wind,
Lower your topsails and take them in;
If the wind comes before the rain,
Lower your topsails and hoist them again.

If wind rises at night,
It will fall at daylight.

Wind in the west,
Suits everyone best.

A southerly wind with showers of rain,
Will bring the wind from the west again.

VP59

WORDS OF A FEATHER

Focus To create a story or poem from a student generated sensory or topical list.

Group Size Individual student to entire class

Time Required 30 minutes

Materials paper and pencil

Physical Setting Classroom, outdoor school or school yard

Process

1. Students generate a list of 10 or more words on a topic(s) designated by the teacher. Example: topic(s) scary words, noise words, plant words.

1. Students then write a story or a poem using 10 of their words.

NOTE: Students soon start seeing words which go together. *Example:* noise words = bang, clang, rang, (rhyming words)

crash, screech, roar (traffic noises)